

# **Methods to Assess Prey Abundance for Possible Wolf Reintroductions on the Olympic Peninsula, Washington, Using DNA from Pellets.**

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## INTRODUCTION

There has been a growing interest in the question of whether to establish a gray wolf (Canis lupus) population on the Olympic Peninsula in Washington State. Prior to the twentieth century wolves were common residents of the Olympic Peninsula (Scheffer 1995). The historical record indicates that by the 1930's or 1940's Olympic Peninsula wolves were likely extinct. The last verified record occurred in 1930's (Scheffer 1995). Today approximately 25% of the peninsula (approximately 3,600 km<sup>2</sup>) is within Olympia National Park) is in the same general condition that existed when wolves were present 100 years ago. However, since the early 1900's the majority of the peninsula landscape outside of the park (~ 12,000 km<sup>2</sup>) has been managed as commercial timberlands and has changed considerably since wolves were last reported on the peninsula.

The large scale changes to the landscape, the uncertain associated effects on any potentially reintroduced wolf population, and a recognized lack of biological information on prey species known to occur on the peninsula, led the U.S. Congress to appropriate funds in 1998 to the U.S. Fish and Wildlife Service to investigate the possibility of reintroducing wolves on the peninsula. In March 1998 the U.S. Fish and Wildlife Service contracted with the University of Idaho to examine the biological feasibility of restoring wolves to their former range on Washington's Olympic Peninsula (Ratti *et al.* 1999). One

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problem facing the feasibility analysis was that there was virtually no quantitative information available on the abundance and densities of the likely prey species, Roosevelt elk (*Cervus elaphus roosevelti*) and black-tailed deer (*Odocoileus hemionus columbianus*), for the peninsula. This was particularly true of black-tailed deer populations both inside and outside of the Olympic National Park. Recognizing this limitation, the U.S. Congress House Report of the Appropriations Committee stated: “these funds should permit the necessary review and research and priority focus should be placed on prey base studies ”.

Although much of the attention so far has centered on the ability of the Olympic National Park to support wolves, there is a need to look at the landscape outside of the park to evaluate wolf reintroductions. Probably the most important reason to consider non-park land as important in determining the likelihood of a successful reintroduction is that almost all (~90%) of the Peninsula-wide winter range of potential prey, (i.e. deer and elk), exists outside of the Olympic National Park boundary. Most of Olympic National Park is over 750 meters in elevation, which is a defining typical winter range for deer and elk on the peninsula (Jenkins *et al.* 1999, Ratti *et al.* 1999). In contrast, non-park land that surrounds the Park is at much lower elevation. Most of the area outside of the Park is below 500 meters in elevation.

Historically abundance estimations of deer in western Washington have ranged from 5-150 deer /sq mile, depending on the local habitat conditions in the surrounding landscape (Ratti *et al.* 1999, Raedeke 1986, Brown 1961). In spite of the fact that black-tailed deer are the most abundant ungulate on the peninsula no method exists for accurately determining the size of the deer population with an adequate level of precision (Raedeke 1993). Western Washington and in particular the Olympic Peninsula receives substantial annual rainfall (over 300 cm) which translates to rapid and heavy growth of underbrush. The presence of the underbrush and dense forest canopy make it especially difficult to directly observe deer. Traditional techniques used to monitor deer have included spotlighting transects, composition counts from deer observed while driving, and in some cases pellet counts.

However the most important and consistent method used to monitor the deer population has relied on the estimated annual number of deer killed during the fall hunting season. Even the most quantitative approach to analyzing deer harvest numbers, at best, provides only an index to changing trends in the population, not reliable estimates of the absolute abundance of black-tailed deer on the peninsula. The scope of this project is to evaluate the feasibility of using DNA genotyping from deer pellets collected along random transects to determine an unbiased estimate of the population abundance of black-tailed deer on the Olympic Peninsula.

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The original objectives of this study were to 1) develop a population estimation technique for black-tailed deer in dense forest of western Washington, and 2) determine the abundance and distribution of black-tailed deer on the Olympic Peninsula outside of the Olympic National Park (ONP).

#### *Acknowledgements*

The U.S. Fish and Wildlife Service funded this study. Washington Department of Fish and Wildlife provided housing in the field and use of vehicles during field collection. A great big thanks goes to the field crew responsible for running the transects and collecting deer pellets across difficult terrain and in the kind of wet weather the Olympic Peninsula is known for. Brett Lyndaker led the crew and did a great job organizing the data and getting it ready for analysis. Joann Wisniewski, Clay Fletcher, and Cheryl Leach contributed tireless energy in the field without which successful pellet collection could not have occurred. Kurt Jenkins and Patti Happe provided logistical support and shared radio-telemetry movement data of black-tailed within Olympic National Park. Helmut Zahn provided field supervision. Jennifer Fangman and Kathleen Hunt provided lab assistance.

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## METHODS

### *Sample Collection*

Two teams of two people each were deployed to sample up to three different habitat strata on the peninsula that represent *a priori* estimates of different deer densities and/or sightability coefficients. A total of 12 one square mile subareas (geographic strata) were selected to serve as the basic landscape unit used to estimate deer densities (Skalski 1994). Each plot was divided into 32 evenly spaced points for starting transects along western and eastern edges of each plot and 32 evenly spaced starting points for transects along north and south edges of each plot.

Selected transect starting points were determined at random. Observers used GPS units to locate transect starting points and were instructed to follow a N-S or E-W line as much as possible, circumventing steep cliffs or waterways as encountered (Figure 2). Our goal was to collect a minimum of 40 pellet groups in each subarea (20 from north-south transects, and 20 from east-west transects). Each pellet group was classified into one of two age-classes, based on a subjective assessment of moisture content, color, and overall appearance. Zero to 2 days old pellets were firm and characterized by green/brown color both external and internal material. Pellets classified as 3-7 days old were brown in color both internal and external, were pliable squishy but not crumbly when pressed. Pellets that were encountered and thought to be older than 7 days were not recorded. Crews were

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trained before conducting surveys in order to calibrate pellet classification among field observers. Pellets were collected during March and April of 1998. Field crews wore latex gloves when collecting pellets, placing pellets in plastic bags. Bags were placed in freezer in each night after collection. At end of field season pellet bags were transferred to genetics lab for extraction and PCR amplification.

Deer pellets collected from one set of transects were used to initially identify known individual deer from each of the subareas. Deer pellets collected during the perpendicular set of transects were used to represent “recaptures” of previously “marked” deer (from the first team) and additional “unmarked” deer. In order to increase probability that the sampled population is closed during the sampling period, only fresh pellets (estimated at less than seven days old) were used in this analysis.

Radio-collared deer from another study conducted by the Olympic National Park (Jenkins *et al.* 1999) were used to intensively monitor daily movements by black-tailed deer during winter. Daily movement data from these deer were used to evaluate the assumption that the deer that dropped the pellets collected were likely still in the square mile subarea sampled over the assumed 7 day pellet deposition period.

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Line transect methods (Buckland *et al.* 1993) were used as independent estimate of deer densities within the same subareas sampled using DNA mark-recapture methods. Pellet data were analyzed using Program Distance, version 2.1(Laake *et al.* 1994). Pellet densities were estimated for each sample plot.

GIS analysis of Washington GAP data (Cassidy 1997) was used to stratify subareas selected by broad classes of forest overstory condition (early, mid, and late sere). We assumed subareas dominated by early sere vegetation would have the highest deer densities and therefore were sampled (n=6) in greater proportion than subareas dominated by mid (n=4) and late successional (n=2) overstory forests (Table 1).

Of the approximately 9,200 km<sup>2</sup> of habitat outside of the Olympic National Park, there were 1,718 km<sup>2</sup> classified as mid-sere and 1,431km<sup>2</sup> classified as late-sere forest canopy. The remaining ~6,000 km<sup>2</sup> of the study area was categorized as early-sere community. As it turned out the scale of the GAP information did not track well with what we saw on the ground so we also recorded the actual vegetation cover type along each transect as it was encountered. Changes in cover type along each transect were noted. Pellet density estimates were then made for each of the different habitats (early, mid, or late sere) found along the transects.

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In order to develop baseline frequencies of allele distribution at each locus we collected tissues samples from individual black-tailed deer. We focused black-tailed deer collection efforts in two heavily hunted deer areas in Game Management Unit 667 (Vail) and GMU 603 Pysht (Figure 1) on the Olympic Peninsula. Successful hunters voluntarily brought deer to established WDFW check stations where biologists cut off a small portion of the deer's tongue. The size of the tissue approximated the size of an eraser on a pencil. The tissue was placed in 100% ethanol and transfer to the WDFW genetics laboratory in Olympia.

### *Protocol Development*

#### Microsatellites

A total of 15 microsatellite primer sets from the literature were evaluated for use on this study. Protocols were developed using DNA isolated from blood of six known black-tailed deer in Washington. Primer sets were first tested for robust amplification and analyzed on silver stained 15% acrylamide gels. The eight most heterozygous of the 15 primer sets were fluorescently labeled and tested with control blood and pellet fecal DNA and analyzed by capillary electrophoresis (ABI 310). From these, we selected the six microsatellite primers with robust PCR amplification and large allelic variability: CRSP-

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1 (Engel *et al.* 1996, Arevalo and et al. 1994), Texan4 (Engel *et al.* 1996, Holder and et al. 1994), RT-5 (Wilson *et al.* 1997), Cal-M, Cal-O and Cal-D (Levine *et al.* 1998).

CRSP-1, Texan-4 and RT-5 are di-nucleotide repeats and Cal-M, Cal-O and Cal-D are tetra-nucleotide repeat microsatellites. We also used two primer-pairs to determine gender: SRY-41F, SRY-121R, ZFX/Y P1-5EZ, ZFX/Y-Sch (Woods *et al.* 1999). All protocols were originally developed at the conservation genetics laboratory of S. Wasser. In early 2000 we switched to the WDFW lab and redesigned many of the PCR protocols to calibrate to the new lab equipment.

DNA was extracted from the tongue tissue (collected at hunter check stations) using 5% Chelex-100 suspension (see Appendix C; (Walsh *et al.* 1991)). A small piece of the preserved tongue tissue (approximately 2 mm<sup>2</sup>) was placed in 200 @L of 5% Chelex-100 suspension with 2 @L of Proteinase K. The tissue/suspension mix was incubated at 65°C until the tissue was digested entirely (30 minutes to several hours). Following digestion the mix was heated to 95°C for five minutes and then centrifuged to pellet the chelex beads and any undigested material. The supernatant was removed and frozen as storage stock. The working stock used in all subsequent PCR reactions was constituted by combining the storage stock and sterile de-ionized water in a 1:19 ratio.

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The same set of microsatellite loci used for the pellets samples were also used for the reference sample set. However, PCR protocols needed to be redeveloped and optimized

for the ABI-377 sequencer in the WDFW laboratory (Appendix for protocols). Because different sequencers (ABI 310 versus ABI-377) can provide slightly different results, a set of samples was run on both machines for all microsatellites and was used to calibrate the results from the ABI-377 to those from the ABI-310.

### Mitochondrial Control Region

We also used Restriction Fragment Length Polymorphisms (RFLPs) of the mtDNA control region, using unpublished primer sequences from Ashland Forensics Lab (Fain and LeMay, pers. com; Appendix C). This provided us one additional genetic marker for a total of 8 markers (6 microsatellites, RFLPs from one section of the mtDNA, and gender) to define the unique genotype of individual deer. RFLPs were determined by: 1) PCR amplification of a portion of the mtDNA control region, 2) digestion with restriction enzyme MseI, 3) electrophoresis on 15% acrylamide gels, and 4) scoring of bands according to observed patterns.

RFLP work was not conducted on the tongue tissue samples. Instead, we developed primer sequences and PCR protocols for sequencing the entire control region of black-tailed deer (see Appendix for protocols). The amplified sequence is roughly 1140 base

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pairs and includes the entire control region and portions of the adjoining tRNA-Pro (Proline) (5' end) and tRNA-Phe (Phenylalanine) (3' end). The 3' end of the amplified DNA is difficult to sequence due to a series of insertions and deletions (i.e. indels) and a high T (thymine) content. Therefore, we established protocols to sequence, with confidence, an 897 bp fragment from the 5' end of the control region, which covers approximately 82% of the entire control region sequence.

Data manipulation and analysis was conducted using SAS for Windows (SAS Institute Inc. 1999). Hardy-Weinberg equilibrium for the microsatellite data was tested using Genetic Data Analysis (Lewis and Zaykin 2001). Phylogenetic comparisons of mitochondria control region sequences were analyzed using maximum likelihood estimates (PAUP\* 4.0, (Swofford 1998).

## RESULTS AND DISCUSSION

### *Line Transect Analysis*

We collected a total of 864 pellet groups, ranging from 20 to 93 groups from 8 to 12 transects in each subarea (Table 2). The total length of transects surveyed was 217 km. We did not meet our goal of 40 pellet groups for 2 of the 12 subareas. Inspection of the pellet data determined there was not a dramatic difference in the detection curves among

the three different habitat types, nor among the two age-classes. Therefore we estimated the final pellet detection curve by pooling all data across the 12 subareas.

The most parsimonious model (A.I.C. value = 1783) determined by Program DISTANCE was the Hazard Rate key :

$$P(k) = 1 - e^{-\left[\left(\frac{d}{A_1}\right)^{-A_2}\right]}$$

where  $P(k)$  = probability of detecting a pellet group,  $d$  = distance (cm) from line transect,  $A_1 = 16.25$ , and  $A_2 = 2.157$ , respectively. Total chi-square Goodness of Fit test was 0.0368,  $p = 0.84783$ .

Pellet groups were readily detected on the transect line, but detection probability dropped rapidly away from the transect line (Figure 3). Detection probability was 0.5 at 20 cm away from line center and approached zero at 1 meter off center of transect. This was similar to the pellet detection curve estimated for the Olympic National Park (Jenkins *et al.* 1999). Overall probability of detection was 0.25 (s.e. 0.013). Estimated density of 0-7 day old pellets was 7,640 pellet groups per square kilometer ( $CV = 7.4\%$ ). The average pellet density estimated in the Olympic National Park (which included an older age class not included in our estimate) was 10,949 groups/km<sup>2</sup> (Jenkins *et al.* 1999).

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Applying a standard deposition rate of 12-16 pellet groups per day per animal (Kirchhoff 1990, Longhurst and Connolley 1982, Neff 1968) and assuming a 7 day deposition period, we estimated an average density of 78 deer per square kilometer (range of 60-102, using lower and upper ranges of deposition rates and 90% C.I. of pellet density). Jenkins *et al.* (1999), using deer pellet transects, estimated deer population density in one study area in the north Olympics to be 5.3 deer /km<sup>2</sup>.

One difference between our study area and Jenkins *et al.* (1999) is that our area included significant level of managed forest landscape which includes a mosaic of age class forests tending to be much younger than those found in Jenkins's study. These early age forests tend to produce more forage for deer and could explain higher densities estimated by this study. However we believe our estimate of deer density is undoubtedly high. It is likely we significantly underestimated the deposition period represented by the deer pellets groups collected. If deer densities in our study areas were similar to those in Jenkins *et al.* (1999) the pellet deposition period for samples we collected would be in the neighborhood of 100 days instead of the 7 days we assumed. Unfortunately we did not record older pellets encountered along transects, which would have allowed us to compare estimates with Jenkins *et al.* (1999) based on assumed 165 day deposition period representing the entire winter range season.

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In general, estimates of deer densities in heavily managed forests in western Washington range from 1-89 deer per square kilometer, with typical densities more in neighborhood of 5-20 deer / km<sup>2</sup> (Ratti *et al.* 1999, Jenkins *et al.* 1999, Raedeke 1986, Brown 1961). Several studies have pointed out problems in estimating age of pellets (Harestad and Bunnell 1987, Ryel 1971, Van Etten and Bennett 1965). One interesting note is that when we conducted the pellet analysis using only 0-2 day old pellets (pellet density estimate = 1,322 pellets / day / square km) the overall density estimate was consistent with the estimate using 0-7 day old pellets ( 1,091 pellets / day / square km), suggesting a similar bias in underestimating age of pellet groups in the 0-2 day category as in the 0-7 day category.

We did find significant differences in the pellet densities according to forest canopy overstory category (Figure 4). Early seral transect pellet densities (8600 groups/ km<sup>2</sup>) and late seral transect pellet densities (7800 groups / km<sup>2</sup> ) were significantly greater than middle age forest transect pellet densities (5200 groups / km<sup>2</sup>).

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*DNA Results - Pellets*

There were considerable problems extracting and amplifying sufficient quantities of DNA material from the pellets. All pellets were collected during winter and were extremely wet when collected. This may have resulted in substantial degradation in the fecal DNA material. In addition, true pellet group ages were likely older than originally thought and may have also contributed to DNA degradation. Because of these difficulties a larger proportion of the budget was spent on protocol development and testing. This limited the total number of pellet groups collected that were actually sampled for DNA. Six subareas were randomly selected for this pilot analysis. In each subarea at least 20 pellet groups in both the north-south and east-west transects were randomly selected for DNA genotyping.

A total of 316 pellet groups were analyzed for microsatellites and gender (Appendix A). Subsequently 260 of these same groups (with one or more amplified locus) were subjected to RFLP analysis. We were unable to amplify any DNA at any of the 8 markers for 18% of the samples (Figure 5). We amplified 4 or more of the 8 markers for 44% of the samples. All 8 markers amplified at 8% of the samples. All the microsatellite loci were highly variable, ranging from 18 alleles at Cal-M to 26 alleles at Cal-O. RFLP amplification and scoring had the highest success: 243 of 260 cases (93%) amplified, revealing 9 different RFLP types (Table 4 and Figure 6). The RFLP variability, coupled

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with an extremely high amplification rate, suggested to us that this approach may make a powerful complement to microsatellite DNA analyses in estimating minimum population size in future work. We determined gender at forty-five percent of the samples, indicating there were in 89 males and 53 females (1.68 males/female) in the sample.

All of the 6 microsatellite loci deviated significantly from Hardy-Weinberg equilibrium, showing an excess of homozygotes (Table 4). We tested to determine if these results were caused from allelic drop-out from degraded fecal DNA. Six predominantly homozygous samples across all loci were re-extracted for DNA in triplicate and each replicate was PCR-amplified seven times for the six loci and gender, comparing percent correspondence.

The results confirmed that allelic dropout was contributing to the large number of homozygous microsatellite loci in the sample set. Additionally, the microsatellite locus Cal-M gave us particular problems during amplification so we dropped it from our list of usable genetic markers. Given these results, we were not confident in identifying genotypes of individual pellet samples and did not conduct a population model estimate from these data. Further work is needed to accurately genotype samples before an appropriate analysis of these data can be made to estimate black-tailed deer on the Olympic Peninsula.

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*DNA Results – Vail-Pysht Tissue*

DNA extraction and PCR amplification was much more successful from tissue collected from harvested deer in the Vail and Pysht study areas (Tables 4a and 4b). We were able to amplify over 90% of the samples attempted for four of the five loci. We did not see allelic drop out or null allele problems encountered with the deer pellet samples.

Heterozygote frequencies were not different from those expected for Hardy-Weinberg equilibrium (Tables 5a and 5b; and Figure 6), although the probability of deviation from Hardy-Weinberg for both Rt-5 and Cal-O was less than 0.10.

The number of alleles for each locus was much less in the tissue samples ( $\bar{X} = 7.4$ ) than identified in the pellets ( $\bar{X} = 23.8$ ). Because of the difficulties we had in extracting, amplifying and scoring the pellet samples, we are not confident that the differences in allele frequencies between the tissue and pellet samples are real. DNA fluorescence levels from the pellet samples were much less than DNA fluorescence levels from tissue samples resulting in difficulties in identifying clean peaks in the electropherograms.

Preliminary results suggest an unexpectedly high variation in identified genotypes between the two study areas Vail and Pysht. Microsatellite differences in allele frequencies were most pronounced for locus CRSP-1 (Tables 5a and 5b, and Figure 7). Expected heterozygosity for CRSP-1 was 0.63 in the Vail study area (number of alleles =

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5) but was only 0.24 in the Pysht area (number of alleles = 2). Control region sequence data (Appendix B) from the baseline samples of deer from Vail and Pysht check stations also suggest these two localities may be functioning as genetically isolated populations. Of the 43 haplotypes (from 9?) tested individuals, no haplotypes are shared between Vail and Pysht study areas. Vail and Pysht are over 100 miles apart and are separated by the Olympic Mountains (see Figure 1). The maximum likelihood estimates of genetic distances suggest the two populations can generally be separated by their control region sequences. The phylogenetic relationship of the control region haplotypes is shown in Figure 8.

Jenkins *et al.* (1999) documented extremely small movements during winter for black-tailed deer on the north side of the Olympic National Park, near Pysht (median home range size = 51 ha). They also found six of ten adult females radio-collared migrated to higher elevations during summer at median distances of 26 km between winter and summer ranges. Their results found that all migratory deer were back on their winter range by the end of October (prior to peak breeding season in mid-late November (Wallmo 1981, Brown 1961). Future work will be necessary to identify and analyze genotypes from deer with home ranges between these two study areas to better understand the possible significance to population dynamics of black-tailed deer on the Olympic Peninsula.

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## SUMMARY AND RECOMMENDATIONS

We were able to collect a large number of presumably relatively fresh black-tailed deer pellets from randomly selected transects on the Olympic Peninsula. A total of 160 staff days were employed to collect 864 pellets from 12 randomly selected one square mile plots. Not all pellets were recorded and collected that were encountered. We restricted our collection to the freshest pellets because we wanted to maximize the potential for extracting high quality DNA and we wanted to minimize collecting pellets that were from individual deer that were no longer resident on the study plot during the period of data collection. The cost for collecting these pellets was approximate \$20 per sample.

Because of the difficulties in determining the age of pellets and subsequent period of pellet deposition we do not recommend line transect analysis to estimate absolute abundance of deer, without additional work to verify actual period of pellet deposition. However, if a general index of population trend is desired, pellet transects can be used to monitor local changes in the population. We were successful in distinguishing significant differences in relative abundance of deer according to habitat type, and geographically different areas.

We did not achieve our original objective to estimate black-tailed deer populations using a DNA-based “mark-recapture” analysis. The difficulties in extracting quality DNA from

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the deer pellets limited our ability to assign individual genotypes to pellet samples with the confidence necessary to apply appropriate models. However, our collective experiences gives us hope that estimating black-tailed deer abundance using this technique may still be feasible. Subsequent to our work on this project we have established a new protocol for extracting DNA from these pellets. The new methods include the use of a new product from Qiagen (QIAamp DNA Stool Mini Kit). This kit is designed to extract either bacterial or human DNA from human fecal material. We have modified and optimized the Qiagen protocols for use with deer pellets and the results have been extremely promising; we have extracted high quality deer DNA from roughly 50% of the pellets sampled thus far. Furthermore we have added an additional six microsatellites loci and have fine-tuned the PCR protocols such that we now have upwards of 10 microsatellites markers, the control region sequence, and gender, which we believe will be successful in genotyping deer pellets.

Results from this project indicate the importance of proper specimen collection and handling protocols. Specifically, user-friendly criteria need to be developed that allow sample collectors to reliably estimate sample age. Detailed attention must be given to sample preservation methods. Uninterrupted freezing immediately (within 12 hours) after collection is the best way to store samples. Repeated freezing and thawing of samples should be avoided. Samples should also be wrapped in a coffee-filter and placed in a zip-

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loc bag, containing a 4:1 ratio of silica to sample, immediately upon collection in the field (Wasser *et al.* 1997).

Sampling efforts should be scheduled during summer if pellets collected during drier months provide higher quality DNA material. Deer pellets subjected to winter or spring rains may yield less DNA due to an accelerated rate of decomposition. We are currently investigating what types of pellets (e.g., hard dry pellets versus soft wet pellets) yield the highest quality DNA. In the future, it will be important to establish protocols for permitting reliable estimates of pellet age. First, fresher pellets may yield higher quality DNA. Second, a more accurate estimate of the age of each pellet group would also provide a better estimate of the deer density in a given area.

Although we did not reach our original objective for this project, as a direct result of this project we now have protocols and procedures that we feel will provide not only high quality DNA from pellet samples, but may enable us to ultimately use DNA material from pellets to estimate deer densities on the Olympic Peninsula. Protocols still need to be refined, but we have made significant headway through a technically demanding process.

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**Table 1. One square mile plots (subareas) sampled during study, Olympic Peninsula, 1998.**

Plot ID	Name	Seral Stage
181031	New London	Mid (Terry et al. 1996)
190727	Prices Peak	Early
190813	Wynoochie Valley NE	Early (Cam et al. 2000)
191126	Copalis Crossing	Mid (Terry et al. 1996)
200708	Wynoochie Valley NE	Early
200720	Wynoochie Valley NE	Early
210731	Grisdale	Mid (Terry et al. 1996)
220829	Larsen Creek	Late
241125	Salmon River E	Early
241213	Salmon River W	Early (Cam et al. 2000)
270230	Mt. Walker	Late
281202	Indian Pass	Mid (Terry et al. 1996)

\*\* Plot ID is combination of Township, Range and Section.

\*\* Seral Stage determined by Washington State Gap Analysis Mapping Project.

\*\* Stages in parentheses under seral stage indicate a large portion (occasionally almost half) of the plot was in that stage.

**Table 2. Black-tailed Deer Pellet Transect Information, Olympic Peninsula 1998.**

Plot ID	Dates Visited	Transect #’s	North South Transects	East West Transects	Pellet Groups Collected
181031**	3/26,4/1	10	1,2,5,6,8	20,23,24,30,32	91
190727**	3/18-3/19	12	2,3,6,10,11,15	17,19,20,22,23,32	88
190813**	3/16- 3/17,3/25	12	4,5,8,9,13,16	19,24,26,29,31,32	93
191126**	3/23-3/25	12	6,9,12,13,14, 16	17,21,23,24,26,31	83
200708	5/5-5/6	12	5,6,7 11,13,16	17,18,25,26,28,31	79
200720	5/7	8	2,6,8,15	17,18,22,28	20
210731	3/11-3/12, 3/17	10	5,9,14,15,16	22,24,25,27,30	93
220829	4/3-4/4	8	5,6,7,16	18,20,21,22	92
241125	4/16, 4/20-4/21	12	3,4,5,12,14,15	17,18,23,26,28,30	25
241213	4/14-4/15	12	4,7,9,10,13,16	21,22,24,30,31,32	47
270230**	4/27-4/29	12	2,3,7,11,13,15	19,24,26,27,29,31	84
281202**	4/8-4/9	12	7,11,12,13,14,16	21,24,27,28,30,32	69

\*\* Indicates Plots sampled for DNA analysis

**Table 3. Black-tailed deer pellet densities for each square mile plot calculated using Program Distance, Olympic Peninsula Washington, 1998.**

PlotID	Pellet Density Estimate	%CV	df	95% Confidence Interval	
181031	9,966	21	10	6,269	15,843
190727	8,907	21	18	7,011	11,316
190813	8,851	11	18	7,003	11,187
191126	7,570	21	13	4,814	11,903
200708	7,419	19	13	4,939	11,144
200720	3,338	26	8	1,862	5,984
210731	10,367	14	12	7,619	14,106
220829	12,711	15	9	9,092	17,770
241125	2,730	26	12	1,575	4,730
241213	4,932	26	12	2,851	8,532
270230	7,809	17	14	5,435	11,222
281202	7,802	23	12	4,331	11,580

**Table 4. Amplification success, expected heterozygosity ( $H_e$ ), and observed heterozygosity ( $H_o$ ) of 6 microsatellite loci, gender and mtDNA RFLP type from black-tailed deer pellets (n=316) collected at 12 square mile plots on Olympic Peninsula, Washington, 1998.**

Locus	n samples	Percent Amplified	Number of Alleles	$H_e$	$H_o$	Prob $H_o \leq H_e$
Gender	142	45%	na	na	na	na
RFLP	243	93% **	na	na	na	na
Texan 4	85	27%	25	0.94	0.26	< 0.000
CRSP-01	141	45%	26	0.93	0.33	< 0.000
RT-5	124	39%	25	0.94	0.48	< 0.000
Cal-M	164	52%	19	0.92	0.58	< 0.000
Cal-O	196	62%	27	0.94	0.63	< 0.000
Cal-D	177	56%	21	0.93	0.54	< 0.000

\*\* Total samples subjected to RFLP analysis = 260

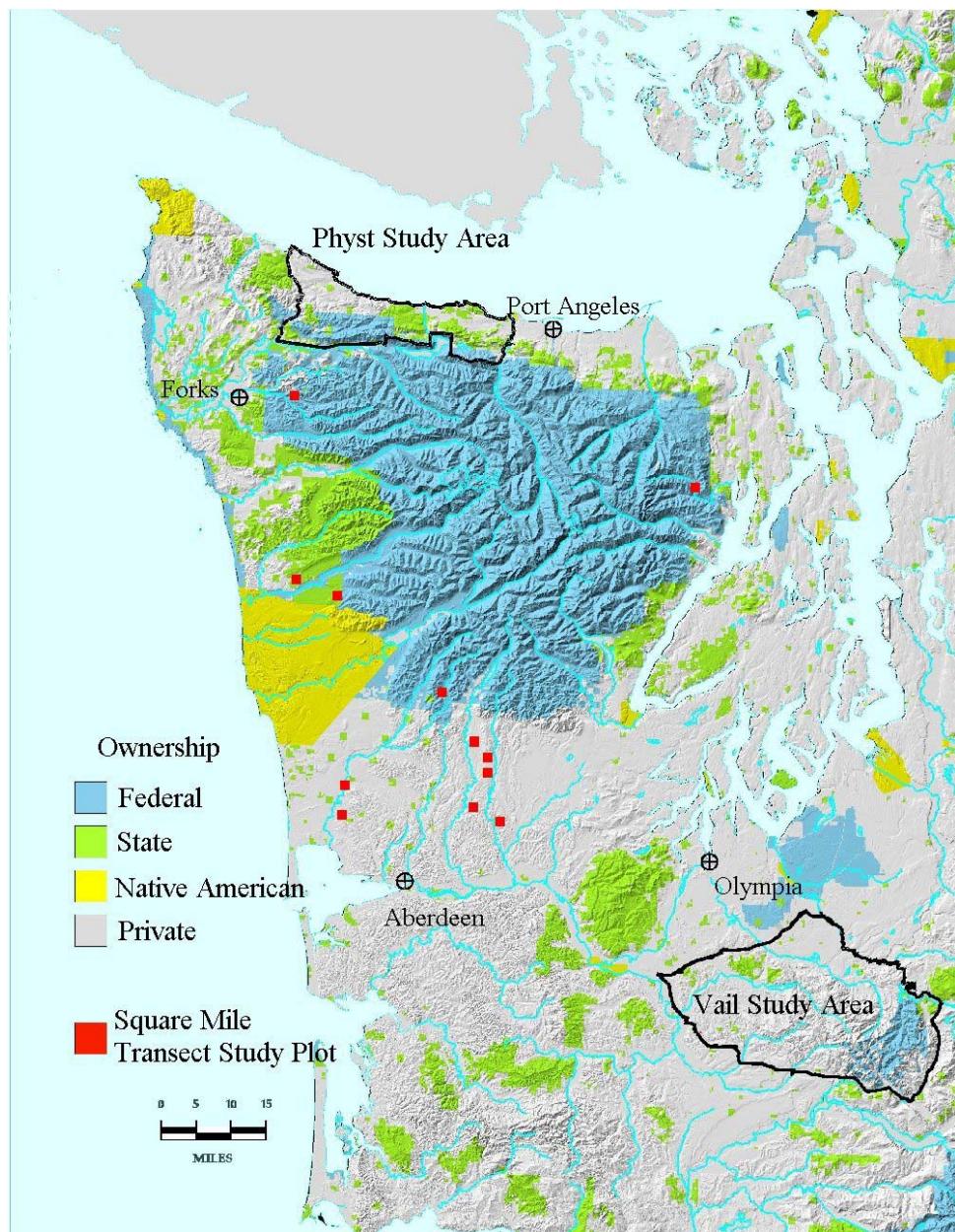
**Table 5a. Amplification success, expected heterozygosity ( $H_e$ ), and observed heterozygosity ( $H_o$ ) of 5 microsatellite loci from black-tailed deer tissue (n=48) collected at Vail Study Area, Washington, 1999.**

Locus	n samples	Percent Amplified	Number of Alleles	$H_e$	$H_o$	Prob $H_o \triangleleft H_e$
Texan 4	45	94%	6	0.72	0.67	< 0.361
CRSP-01	46	96%	5	0.63	0.59	< 0.216
RT-5	47	98%	9	0.82	0.81	< 0.802
Cal-O	41	85%	8	0.79	0.83	< 0.794
Cal-D	46	96%	8	0.85	0.74	< 0.120

**Table 5b. Amplification success, expected heterozygosity ( $H_e$ ), and observed heterozygosity ( $H_o$ ) of 5 microsatellite loci, from black-tailed deer tissue (n=44) collected at Pysht Study Area, Washington, 1999.**

Locus	n samples	Percent Amplified	Number of Alleles	$H_e$	$H_o$	Prob $H_o \triangleleft H_e$
Texan 4	43	98%	4	0.63	0.65	< 0.660
CRSP-01	44	100%	2	0.24	0.25	< 1.000
RT-5	43	98%	6	0.72	0.60	< 0.089
Cal-O	41	93%	7	0.75	0.66	< 0.062
Cal-D	43	98%	7	0.77	0.74	< 0.789

**Figure 1. Olympic Peninsula Deer Study Area, showing randomly selected 1 sq. mile subareas.**



**Figure 2.** Enlargement of 1 subarea (Transect ID 190813) showing north-south and east-west transect lines, and deer pellet locations (circles) encountered along transects.

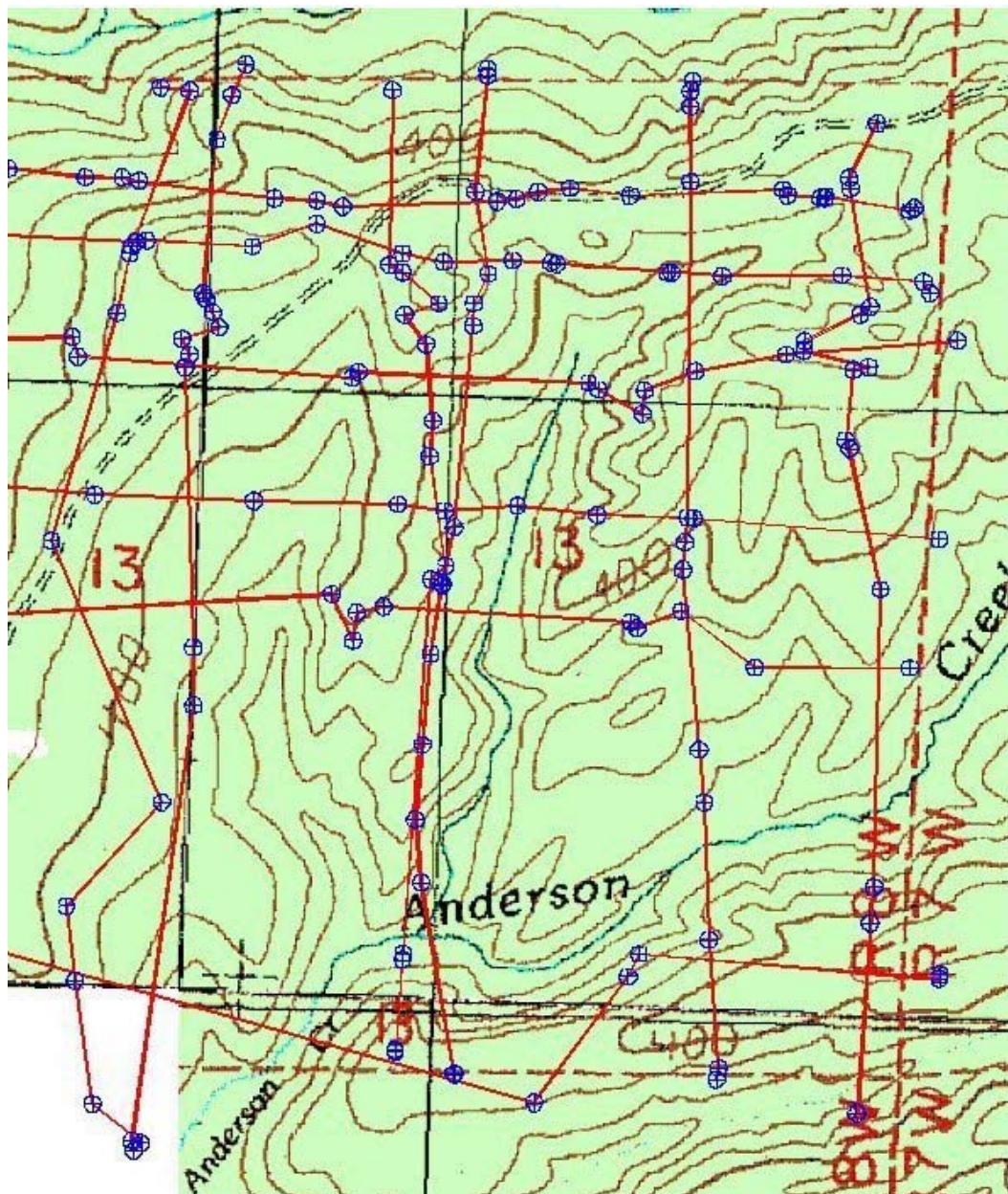
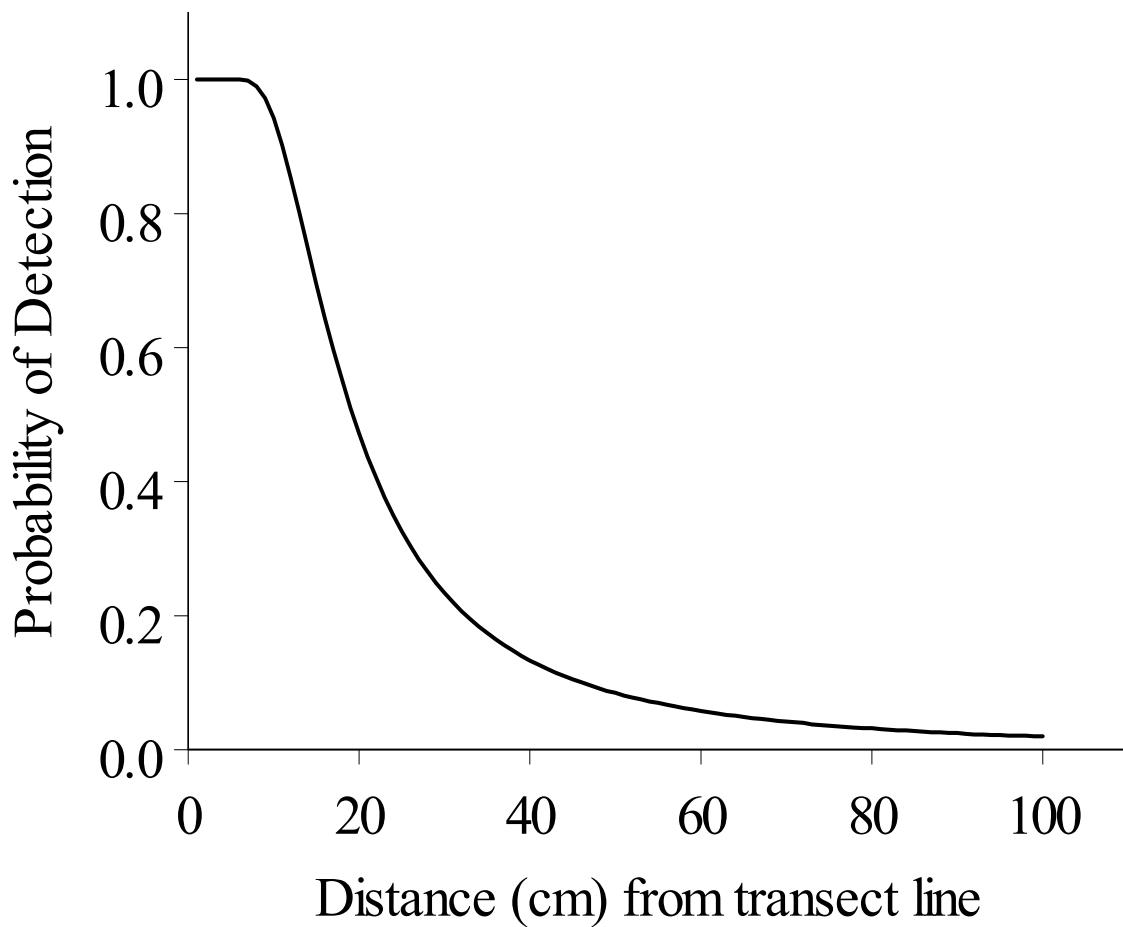
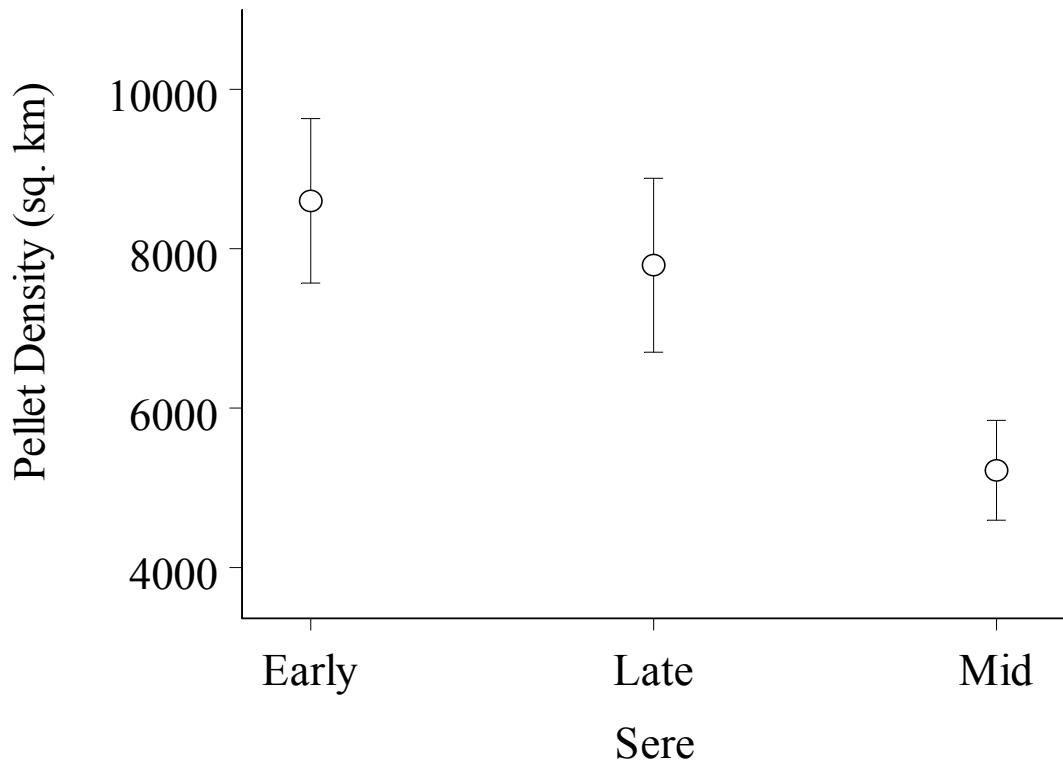


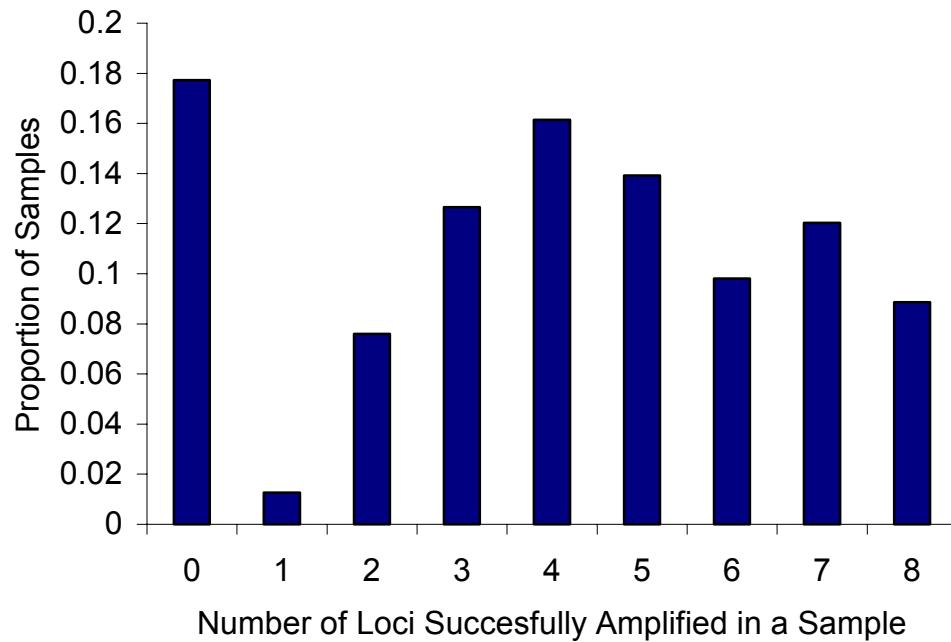
Figure 3. Black-tailed deer pellet detection curve along line transects in Olympic Peninsula, Washington.



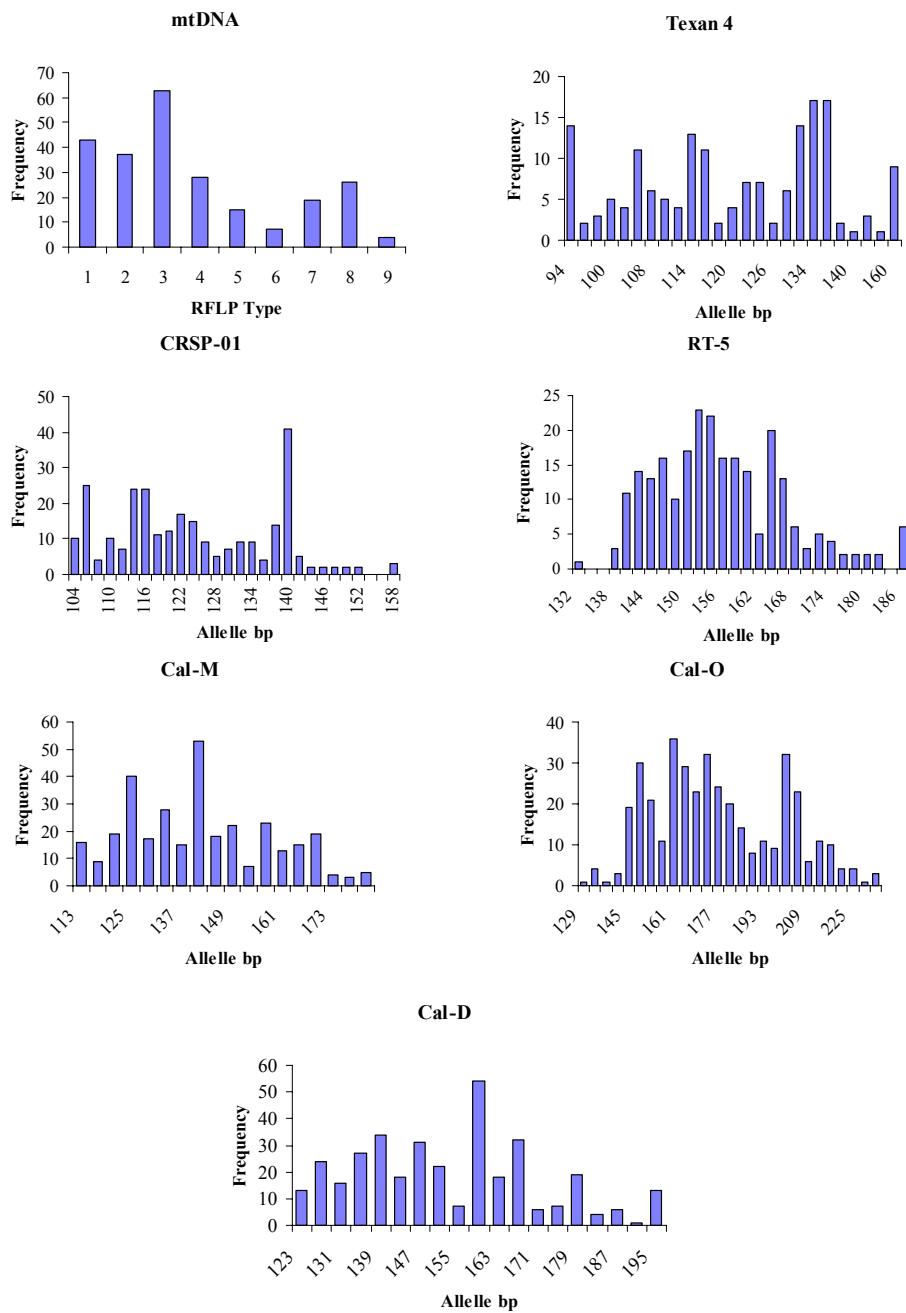
**Figure 4. Black-tailed deer pellet densities (and s.d. error bars) in three different seral age class of forest overstory, Olympic Peninsula Washington, 1998.**



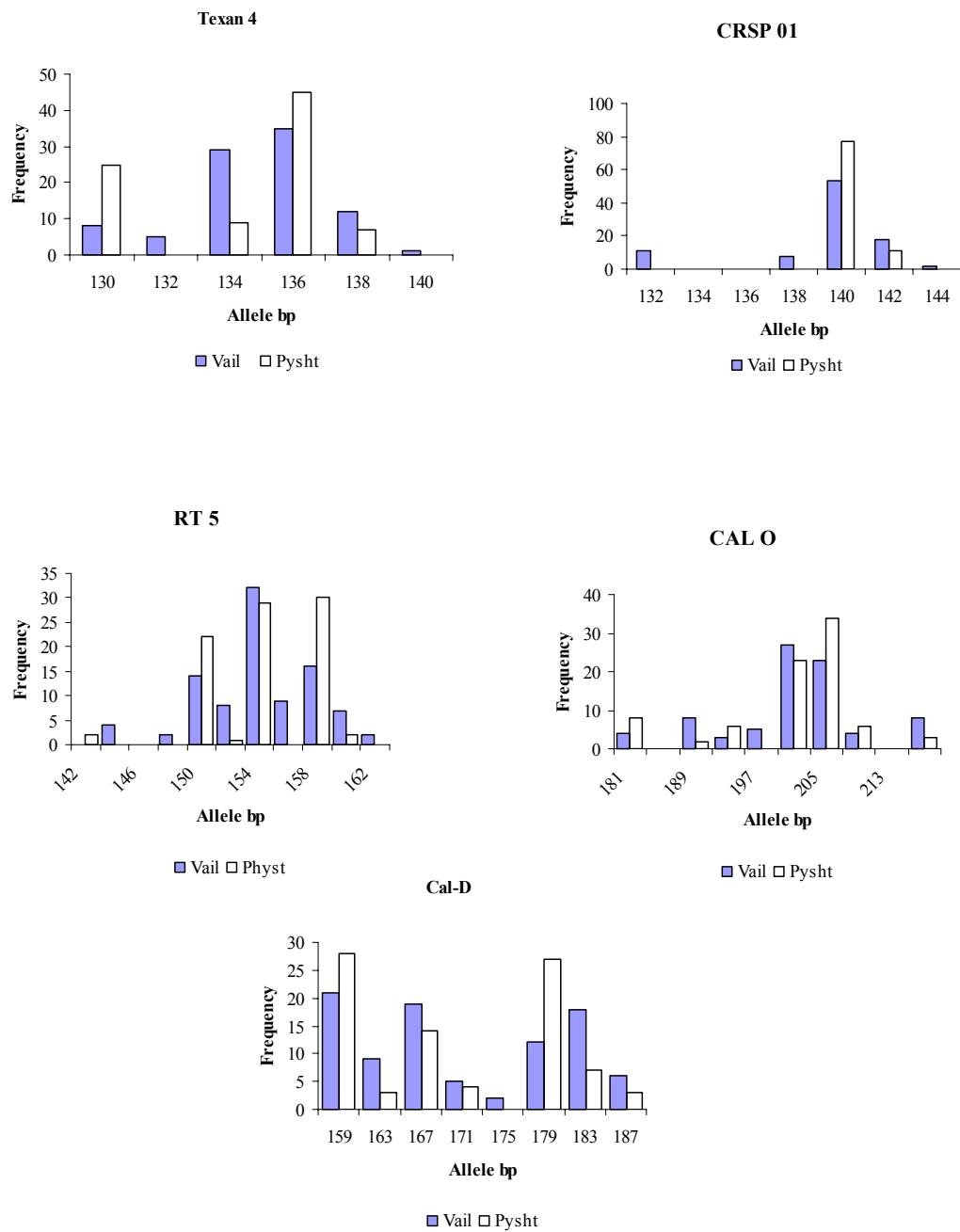
**Figure 5. The percentage of total samples with successful amplification of DNA at 8 different genetic markers (6 microsatellites, sex, and mtDNA control region).**



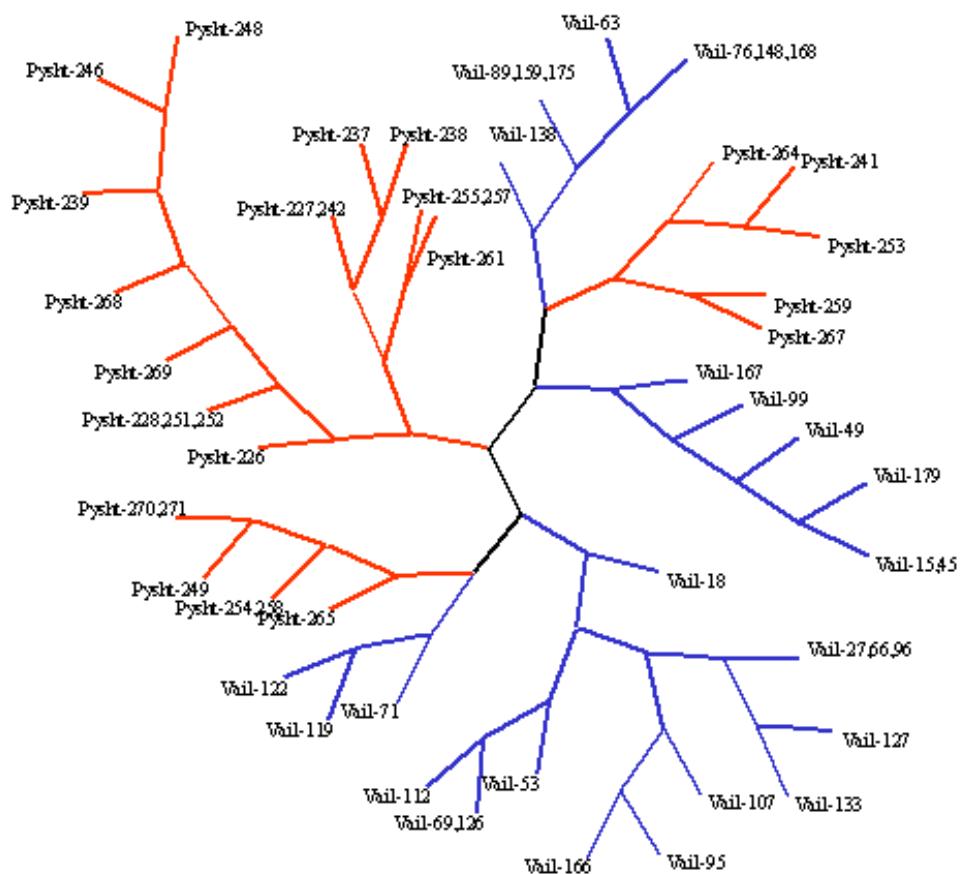
**Figure 6. Allele frequency distribution at 6 microsatellite loci and mtDNA RFLP type from black-tailed deer pellets collected at 10 sites on the Olympic Peninsula, Washington.**



**Figure 7. Allele frequency distribution for 5 different microsatellite loci from black-tailed deer tissue at Vail (n=48) and Pysht (n=44) study areas, western Washington.**



**Figure 8. Unrooted phylogeny diagram of 43 haplotypes for mitochondria control region sequence data from two black-tailed deer populations, Vail (n=30) and Pysht (n=28) in western Washington.**





Appendix A: DNA Results from Black-tailed Deer Pellets Collected on Olympic Peninsula.

Sample	Plot ID	Transect	Specimen	RFLP	TEXAN4	CRSP-01	RT-5	CAL-M	CAL-O	CAL-D	Gender	Alleles
1	181031	1	1	type6	160/160	???	146/146	145/145	149/149	???	???	???
2	181031	2	1	type2	94/94	130/140	154/154	???	169/209	127/127	M	115
3	181031	5	1	type5	???	118/124	158/164	157/157	173/189	139/151	M	115
4	181031	5	3		???	???	???	???	???	???	???	???
5	181031	5	4	type4	???	???	???	129/129	???	???	???	???
6	181031	5	6	type2	???	???	???	???	141/149	123/123	???	???
7	181031	5	8	type2	???	104/116	138/140	153/173	205/205	139/139	M	115/126
8	181031	5	9	na	???	140/140	???	???	???	???	???	???
9	181031	5	10	type1	???	106/106	???	121/133	153/153	135/146	M	115/126
10	181031	5	12	type4	???	???	???	???	145/145	???	???	???
11	181031	5	14	type1	???	???	154/154	121/149	149/193	167/167	M	115/126
12	181031	5	15	type9	100/100	128/128	152/154	141/141	169/217	123/147	M	115/126
13	181031	5	17	type1	???	???	154/154	137/149	177/185	179/191	F	126
14	181031	6	1	na	94/94	124/124	???	???	???	???	M	115
15	181031	6	2		???	???	???	???	???	???	???	???
16	181031	6	4	type8	142/142	122/122	144/146	121/157	157/157	131/135	M	115/126
17	181031	6	5	type8	124/124	118/122	???	129/165	189/201	143/155	M	115
18	181031	6	6	type2	???	???	???	141/157	133/133	151/151	???	???
19	181031	6	8	type4	98/98	120/120	152/152	145/145	149/177	179/179	F	126
20	181031	6	9	type1	???	???	???	141/173	129/177	129/179	F	126
21	181031	6	10	type2	???	???	???	???	157/157	???	???	???
22	181031	6	11	type6	???	???	???	149/161	153/165	155/163	???	???
23	181031	8	1	type1	???	116/126	156/164	177/177	177/213	175/175	M	115
24	181031	8	2	type2	???	136/140	140/140	153/165	217/225	163/171	F	126
25	181031	8	3	type4	???	???	???	129/129	205/205	???	???	???
26	181031	8	5	type3	116/116	???	140/140	141/169	173/201	139/143	???	???
27	181031	8	6	type4	???	148/148	160/182	149/157	201/217	159/167	F	126

Appendix A: DNA Results from Black-tailed Deer Pellets Collected on Olympic Peninsula.

Sample	Plot ID	Transect	Specimen	RFLP	TEXAN4	CRSP-01	RT-5	CAL-M	CAL-O	CAL-D	Gender	Alleles
28	181031	8	8	type3	132/142	110/122	150/150	141/169	185/205	159/159	F	126
29	181031	8	9	type5	132/132	114/114	150/150	125/173	173/181	175/175	M	115
30	181031	8	11	type8	???	112/112	140/174	???	181/193	???	M	115
31	181031	20	3		???	???	???	???	???	???		???
32	181031	20	4	type2	???	???	???	???	161/161	159/159		???
33	181031	20	5		???	???	???	???	???	???		???
34	181031	20	7	type4	122/122	122/122	166/166	???	???	159/159	M	115/126
35	181031	23	1	type5	120/120	???	142/142	149/157	149/149	167/179		???
36	181031	23	2	type8	???	120/120	???	157/161	197/209	139/139	M	115
37	181031	23	4	type1	106/106	116/116	144/144	145/149	149/217	127/127		???
38	181031	23	5	type6	132/132	134/134	140/154	137/153	197/205	127/179	M	115/126
39	181031	23	6	type3	136/136	???	???	133/173	173/209	147/167	M	115
40	181031	23	7	type1	???	142/150	144/144	153/157	161/161	???		???
41	181031	23	8	type1	???	138/138	144/144	137/165	201/201	147/155	F	126
42	181031	23	9	type2	136/136	114/140	162/166	137/165	177/213	167/167	F	126
43	181031	23	10	na	???	108/120	160/160	133/137	177/177	???	M	115
44	181031	24	2	type4	???	???	???	157/157	153/201	???	M	115
45	181031	24	4	type4	???	???	???	???	153/201	123/123		???
46	181031	24	5	type9	???	???	???	???	153/153	???		???
47	181031	24	6	type2	102/102	???	???	149/157	201/213	???	F	126
48	181031	24	8	type4	132/132	122/122	164/164	141/141	185/205	???	F	126
49	181031	24	9	type3	110/110	112/112	156/156	???	173/173	159/159		???
50	181031	24	10	type1	???	118/118	164/168	???	161/181	139/147	M	115/126
51	181031	24	11	type2	116/116	???	???	141/145	169/177	135/143	M	115
52	181031	24	12	type3	98/140	158/158	158/158	125/133	169/185	???	M	115/126
53	181031	24	13	type1	???	118/130	158/160	157/157	153/153	135/163???	F	126
54	181031	30	1		???	???	???	???	???	???		???
55	181031	30	2		???	???	???	???	???	???		???
56	181031	30	8		???	???	???	???	???	???		???

Appendix A: DNA Results from Black-tailed Deer Pellets Collected on Olympic Peninsula.

Sample	Plot ID	Transect	Specimen	RFLP	TEXAN4	CRSP-01	RT-5	CAL-M	CAL-O	CAL-D	Gender	Alleles
57	181031	30	9		???	???	???	???	???	???	???	???
58	181031	30	10	type4	132/132	126/126	164/164	141/141	185/205	???	F	126
59	181031	30	11		???	???	???	???	???	???	???	???
60	181031	30	12		???	???	???	???	???	???	???	???
61	190727	2	1	type1	???	122/122	152/170	141/157	161/181	131/131	???	
62	190727	2	3	type5	124/124	116/116	142/142	141/141	???	127/135	F	126
63	190727	2	5	type5	122/124	120/120	138/142	145/145	153/157	131/139	F	126
64	190727	3	3	type8	106/114	???	156/156	121/157	153/201	147/155	M	115/126
65	190727	3	6	type2	???	138/138	???	133/141	213/217	159/159	???	
66	190727	3	7	na	???	???	???	169/181	181/209	159/163	???	
67	190727	6	2	type4	???	???	146/146	117/125	201/213	139/139	???	
68	190727	6	3	type4	???	106/106	164/166	???	???	131/131	F	126
69	190727	10	1	na	???	124/134	142/154	???	193/193	135/135	M	115/126
70	190727	10	4	type4	???	116/116	???	???	149/173	143/143	F	126
71	190727	10	5	type4	???	116/116	164/186	???	165/165	163/163	???	
72	190727	10	6	type6	???	116/116	146/150	161/161	161/161	139/159	F	126
73	190727	11	1	type3	???	132/140	186/186	141/141	149/169	159/159	M	115/126
74	190727	11	4	type7	???	114/114	162/176	169/169	169/209	167/167	M	115/126
75	190727	11	6	na	108/108	106/122	138/152	141/157	177/177	???	F	126
76	190727	11	7	type9	134/134	???	???	???	???	???	???	
77	190727	11	10	type1	106/106	120/142	150/172	121/121	173/225	195/195	M	115
78	190727	15	1	type7	???	116/116	???	???	???	???	???	
79	190727	15	3	type3	???	???	???	???	165/181	139/139	M	115
80	190727	15	4	na	100/100	104/104	164/174	???	???	167/167	M	115
81	190727	17	4	type1	124/124	???	???	117/133	???	???	???	
82	190727	17	5	type1	???	???	???	141/141	177/201	139/147	???	
83	190727	17	6	type2	112/112	116/116	140/142	???	201/205	???	???	
84	190727	17	7	type8	136/136	124/124	???	117/129	149/173	143/167	M	115/126
85	190727	17	8	type2	???	128/128	178/178	117/149	165/165	???	F	126

Appendix A: DNA Results from Black-tailed Deer Pellets Collected on Olympic Peninsula.

Sample	Plot ID	Transect	Specimen	RFLP	TEXAN4	CRSP-01	RT-5	CAL-M	CAL-O	CAL-D	Gender	Alleles
86	190727	19	1	type2	???	116/140	176/182	???	???	167/195	???	
87	190727	19	2	type8	134/134	116/116	160/160	121/149	201/217	???	???	
88	190727	19	3	type3	???	???	152/154	141/141	205/213	179/179	M	115/126
89	190727	19	4	type4	???	114/114	152/152	141/141	173/173	167/167	M	115
90	190727	20	1	type3	???	114/114	156/156	???	???	???	M	115/126
91	190727	20	3	type3	???	???	???	141/141	169/173	143/147	M	115
92	190727	20	5	type8	106/106	132/132	???	157/157	173/201	???	???	
93	190727	20	6	type1	112/128	122/132	146/164	129/149	173/181	159/159	F	126
94	190727	20	7	type8	???	142/142	152/158	157/169	201/201	143/147	M	115/126
95	190727	20	8	na	108/108	???	142/146	???	173/209	175/175	M	115
96	190727	22	4	type8	???	114/114	???	???	???	???	M	115
97	190727	22	5	type8	106/106	118/118	???	117/121	201/205	???	???	
98	190727	22	6	type8	???	134/134	152/160	129/129	165/169	123/127	???	
99	190727	22	8	type3	???	120/150	152/152	141/165	165/165	143/163	M	115/126
100	190727	22	9	type3	???	112/132	164/164	121/141	161/229	143/143	M	115/126
101	190813	4	3		???	???	???	???	???	???	???	
102	190813	4	5		???	???	???	???	???	???	???	
103	190813	5	1		???	???	???	???	???	???	???	
104	190813	5	3		???	???	???	???	???	???	???	
105	190813	5	4	type8	132/136	138/140	154/154	125/145	189/193	159/167	F	126
106	190813	5	5		???	???	???	???	???	???	???	
107	190813	5	6		???	???	???	???	???	???	???	
108	190813	5	7	type8	???	138/138	152/156	113/113	???	???	F	126
109	190813	8	1	type3	???	140/140	150/150	???	201/201	???	???	
110	190813	8	3		???	???	???	???	???	???	???	
111	190813	8	5	type8	???	138/142	156/158	113/121	???	???	M	115/126
112	190813	8	8	type8	???	110/110	142/142	???	???	???	F	126
113	190813	9	1	type4	???	130/130	???	???	???	???	???	
114	190813	9	4	type8	???	???	168/168	???	???	123/135	M	115

DNA methods to estimate wolf prey densities on the Olympic Peninsula, Washington

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Appendix A: DNA Results from Black-tailed Deer Pellets Collected on Olympic Peninsula.

Sample	Plot ID	Transect	Specimen	RFLP	TEXAN4	CRSP-01	RT-5	CAL-M	CAL-O	CAL-D	Gender	Alleles
115	190813	9	5		??	??	??	??	??	??	??	??
116	190813	9	6	type3	??	106/106	146/156	??	??	??	??	??
117	190813	9	7	type4	134/134	??	144/168	??	??	??	F	126
118	190813	13	1		??	??	??	??	??	??	??	??
119	190813	13	2	type4	136/136	??	142/142	??	??	??	??	??
120	190813	13	3		??	??	??	??	??	??	??	??
121	190813	13	4	type2	??	106/114	158/160	??	??	??	M	115/126
122	190813	13	5	type3	??	116/140	??	??	??	??	M	115
123	190813	13	6		??	??	??	??	??	??	??	??
124	190813	16	2	noamp	116/116	140/140	??	??	??	??	??	??
125	190813	16	3	na	??	??	??	125/129	??	??	??	??
126	190813	16	4		??	??	??	??	??	??	??	??
127	190813	16	5		??	??	??	??	??	??	??	??
128	190813	16	7		??	??	??	??	??	??	??	??
129	190813	16	8		??	??	??	??	??	??	??	??
130	190813	16	9		??	??	??	??	??	??	??	??
131	190813	19	1	type3	100/138	140/140	148/180	125/133	161/161	179/179	M	115
132	190813	19	2	type3	??	??	??	141/141	133/145	135/139	??	??
133	190813	24	1	type3	128/128	118/132	158/170	141/141	185/205	167/187	F	126
134	190813	24	2	type3	??	116/116	156/156	??	173/177	127/159	??	??
135	190813	24	3	type3	134/136	140/140	154/156	133/137	205/205	159/167	F	126
136	190813	24	4	type2	??	??	148/166	??	??	??	F	126
137	190813	24	6	type3	106/106	??	??	125/153	165/181	127/163	??	??
138	190813	24	7	type8	??	124/140	??	113/113	??	123/123	F	126
139	190813	24	8	type4	134/134	106/106	152/156	??	??	??	M	115/126
140	190813	26	1	type3	136/144	140/140	150/150	145/161	??	151/167	??	??
141	190813	26	2	type4	??	140/140	154/154	141/141	145/205	147/167	M	115/126
142	190813	26	3	type8	??	??	??	145/145	189/201	159/159	??	??
143	190813	26	4	type7	??	120/140	152/152	??	149/169	??	??	??

Appendix A: DNA Results from Black-tailed Deer Pellets Collected on Olympic Peninsula.

Sample	Plot ID	Transect	Specimen	RFLP	TEXAN4	CRSP-01	RT-5	CAL-M	CAL-O	CAL-D	Gender	Alleles
144	190813	29	1	type3	???	???	152/160	113/125	181/205	159/167	M	115
145	190813	29	2	type3	???	???	???	125/149	137/149	139/195	???	
146	190813	29	3	type3	???	???	???	141/141	149/149	???	???	
147	190813	29	5	type1	???	140/146	146/158	157/165	161/201	143/159	M	115/126
148	190813	29	7	na	134/134	138/140	154/154	133/157	205/205	159/167	F	126
149	190813	31	1	type8	???	???	152/152	???	169/169	139/139	F	126
150	190813	31	2	type8	132/134	140/140	146/154	???	???	???	F	126
151	190813	31	4	type3	108/108	110/110	152/152	129/145	149/185	159/183	F	126
152	190813	31	5	type8	???	???	???	133/149	133/193	131/179	???	
153	190813	31	6	type8	126/132	134/138	186/186	137/137	145/145	139/139	F	126
154	190813	31	7	type8	???	???	???	149/161	197/205	147/159	???	
155	190813	31	8	type5	???	144/144	150/150	???	???	127/127	???	
156	190813	31	10	type1	???	???	???	125/141	193/201	167/167	???	
157	190813	32	3	type8	???	118/118	140/162	169/169	177/181	147/159	M	115/126
158	190813	32	4	type3	114/160	126/132	148/148	???	???	???	F	126
159	190813	32	7	type3	???	???	???	141/169	173/213	159/159	???	
160	190813	32	8	type1	???	???	???	133/161	165/181	159/163	???	
161	191126	6	1	type4	???	???	???	129/129	145/185	147/147	???	
162	191126	6	3	na	???	???	???	???	161/161	163/163	???	
163	191126	9	1	type2	???	???	???	141/141	165/165	167/167	???	
164	191126	9	2	type2	???	???	???	???	???	139/139	???	
165	191126	9	3		???	???	???	???	???	???	???	
166	191126	9	4		???	???	???	???	???	???	???	
167	191126	9	5		???	???	???	???	???	???	???	
168	191126	9	6	na	???	???	???	125/145	161/161	123/159	???	
169	191126	9	7	type9	???	???	???	125/129	???	???	???	
170	191126	9	8	type4	???	???	???	???	173/173	???	???	
171	191126	9	11	type3	???	???	???	???	149/149	147/147	???	
172	191126	9	13	type2	???	???	???	141/141	???	???	???	

DNA methods to estimate wolf prey densities on the Olympic Peninsula, Washington

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Appendix A: DNA Results from Black-tailed Deer Pellets Collected on Olympic Peninsula.

Sample	Plot ID	Transect	Specimen	RFLP	TEXAN4	CRSP-01	RT-5	CAL-M	CAL-O	CAL-D	Gender	Alleles
173	191126	9	14		???	???	???	???	???	???	???	???
174	191126	9	15	type2	???	???	???	125/125	???	???	???	???
175	191126	9	16		???	???	???	???	???	???	???	???
176	191126	12	4	type2	???	???	???	125/137	???	???	???	???
177	191126	12	6	type3	???	???	???	125/125	173/173	127/131	???	???
178	191126	13	1		???	???	???	???	???	???	???	???
179	191126	13	4	type6	???	???	???	145/145	145/149	147/147	???	???
180	191126	13	5	type7	96/96	???	???	???	???	???	M	115
181	191126	13	7	type7	???	???	???	???	161/161	127/131	M	115
182	191126	14	1	type2	???	???	???	149/149	???	???	???	???
183	191126	14	3	type2	???	???	???	149/149	177/189	143/155	???	???
184	191126	14	4	type7	???	110/122	???	???	153/161	123/151	???	???
185	191126	14	6	type7	???	???	???	???	165/165	163/163	???	???
186	191126	14	9	type3	???	???	???	???	173/177	127/171	???	???
187	191126	14	10		???	???	???	???	???	???	???	???
188	191126	14	11		???	???	???	???	???	???	???	???
189	191126	16	1	type1	???	???	???	???	177/193	127/139	???	???
190	191126	16	2	type1	???	???	???	133/133	165/165	131/167	???	???
191	191126	17	1	type3	???	???	164/164	???	185/233	187/187	F	126
192	191126	17	2	type3	122/122	122/136	148/166	121/125	145/145	135/143	F	126
193	191126	17	3	type3	???	???	166/166	125/133	161/177	???	M	115/126
194	191126	21	1	type1	???	106/106	???	???	173/173	139/151	F	126
195	191126	21	2	type3	122/122	108/114	174/174	133/145	???	139/159	F	126
196	191126	21	3	type3	134/134	120/120	156/180	121/129	157/161	???	F	126
197	191126	21	4	type1	???	106/106	???	???	???	159/159	M	115/126
198	191126	21	5	type1	???	114/132	148/166	133/133	145/145	147/159	M	115/126
199	191126	21	6		???	???	???	???	???	???	???	???
200	191126	21	7	type3	???	???	???	133/133	145/145	147/159	???	???
201	191126	21	8	na	???	110/110	172/172	169/169	???	???	???	???

Appendix A: DNA Results from Black-tailed Deer Pellets Collected on Olympic Peninsula.

Sample	Plot ID	Transect	Specimen	RFLP	TEXAN4	CRSP-01	RT-5	CAL-M	CAL-O	CAL-D	Gender	Alleles
202	191126	21	9		???	???	???	???	???	???	???	???
203	191126	24	1	type3	???	112/112	???	141/157	141/145	???	???	???
204	191126	24	2	type3	???	???	162/162	125/149	153/181	179/195	M	115
205	191126	24	6	type3	???	???	???	???	???	???	M	115
206	191126	24	7	type1	???	???	???	121/125	145/161	135/143	???	???
207	191126	24	8	type7	???	???	???	121/125	???	127/135	???	???
208	191126	24	9	na	???	???	???	mixed	mixed	159/179	???	???
209	191126	24	10	type7	???	???	???	169/169	153/153	???	???	???
210	191126	26	1	na	???	???	???	133/133	???	???	???	???
211	191126	26	2	type3	120/120	124/124	146/146	???	???	???	???	???
212	191126	26	3	type3	???	106/116	???	137/137	161/173	159/159	F	126
213	191126	26	4	type3	???	106/106	132/142	141/169	181/201	147/195	M	115
214	191126	26	5	type3	???	???	156/156	???	149/149	151/151	???	???
215	191126	26	6	type3	118/118	106/106	146/154	125/161	165/193	159/159	M	115/126
216	191126	26	7	type3	???	???	???	???	201/205	179/179	???	???
217	191126	26	8	type2	???	120/120	144/150	113/137	???	???	???	???
218	191126	31	1	type1	???	???	???	135/145	169/177	135/167	???	???
219	270230	7	3	type1	112/136	140/140	152/158	113/149	189/213	135/135	M	115
220	270230	7	4	na	???	110/124	???	???	177/225	167/183	M	115
221	270230	11	11	type7	???	104/104	???	125/125	149/173	127/147	M	115/126
222	270230	13	1	type2	???	???	???	???	???	???	M	115
223	270230	13	2		???	???	???	???	???	???	???	???
224	270230	13	3	type1	94/94	104/114	154/166	???	???	127/131	???	???
225	270230	13	4	type7	???	104/126	166/166	113/113	169/169	135/135	???	???
226	270230	15	1	type7	???	???	???	???	169/169	???	???	???
227	270230	15	2	na	???	???	???	165/165	165/165	131/135	???	???
228	270230	15	3	type7	???	138/138	???	165/165	169/185	135/135	???	???
229	270230	15	4	type1	114/136	140/140	150/150	???	201/205	159/179	???	???
230	270230	15	5	type1	114/114	???	???	125/125	217/217	131/131	???	???

DNA methods to estimate wolf prey densities on the Olympic Peninsula, Washington

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Appendix A: DNA Results from Black-tailed Deer Pellets Collected on Olympic Peninsula.

Sample	Plot ID	Transect	Specimen	RFLP	TEXAN4	CRSP-01	RT-5	CAL-M	CAL-O	CAL-D	Gender	Alleles
231	270230	15	6	type1	???	???	???	125/133	161/169	159/171	???	
232	270230	15	7		???	???	???	???	???	???	???	
233	270230	15	8	type7	???	140/140	???	129/141	149/197	151/151	F	126
234	270230	15	9	type5	???	???	???	???	???	???	???	
235	270230	15	10	type7	???	???	160/160	125/125	???	151/151	???	
236	270230	15	11	type2	???	???	???	133/141	173/185	187/187	M	115
237	270230	15	12		???	???	???	???	???	???	???	
238	270230	15	13	type3	???	???	???	133/133	???	???	???	
239	270230	19	1	type1	116/136	130/140	172/172	181/181	201/221	135/151	M	115/126
240	270230	19	2	type4	???	122/124	???	???	???	135/135	M	115
241	270230	19	3	type2	114/116	130/146	140/150	129/137	217/217	139/171	M	115/126
242	270230	19	4	type8	???	122/130	154/154	125/161	161/213	159/159	F	126
243	270230	19	5	type1	???	122/122	148/148	125/177	185/185	???	M	115
244	270230	19	6		???	???	???	???	???	???	???	
245	270230	24	1	type3	160/160	116/116	164/170	???	???	???	M	115/126
246	270230	24	2	type4	???	104/110	???	125/125	161/161	???	F	126
247	270230	26	1	type2	???	114/114	???	???	???	???	M	115
248	270230	26	2	type2	???	???	???	???	149/161	139/151	???	
249	270230	26	3	type1	94/94	104/104	???	149/149	181/221	151/183	F	126
250	270230	26	4	type1	160/160	108/108	???	???	149/173	123/127	M	115
251	270230	26	5	type5	???	106/106	???	117/121	153/225	127/127	F	126
252	270230	26	6	type1	???	???	???	149/153	157/173	147/147	???	
253	270230	26	7	type2	94/94	124/124	150/158	161/181	177/177	139/151	M	115/126
254	270230	26	8	type1	???	???	144/148	???	181/181	???	???	
255	270230	26	20		???	???	???	???	???	???	???	
256	270230	26	21	type6	???	???	???	???	???	161/161	???	???
257	270230	27	7	type6	???	???	???	???	197/197	151/151	???	
258	270230	27	9	type5	116/116	???	???	???	221/221	147/147	M	115
259	281202	7	1	type3	110/114	152/152	146/148	???	149/149	135/159	M	115/126

Appendix A: DNA Results from Black-tailed Deer Pellets Collected on Olympic Peninsula.

Sample	Plot ID	Transect	Specimen	RFLP	TEXAN4	CRSP-01	RT-5	CAL-M	CAL-O	CAL-D	Gender	Alleles
260	281202	7	2		??	??	??	??	??	??	??	??
261	281202	7	3	type4	??	126/126	168/168	117/117	141/181	143/163	F	126
262	281202	7	4	type1	??	??	??	??	145/145	159/195	??	
263	281202	7	5	type5	??	118/128	??	??	165/197	195/195	M	115/126
264	281202	7	6	type3	128/128	140/158	158/166	??	??	??	F	126
265	281202	12	1	type5	116/132	134/134	140/146	125/137	201/233	127/159	M	115
266	281202	12	2	type5	114/114	106/106	164/164	141/161	161/173	171/183	M	115
267	281202	12	3	type1	160/160	??	164/164	??	??	??	??	
268	281202	12	4	type3	134/134	??	??	??	??	??	M	115
269	281202	12	5	type3	??	??	??	??	149/149	151/151	F	126
270	281202	13	1	type3	114/114	124/124	144/144	??	189/201	135/135	M	115/126
271	281202	13	2	type2	??	??	??	113/113	??	??	??	
272	281202	13	3	type7	94/94	136/136	??	??	??	147/147	M	115/126
273	281202	13	4	type7	??	132/134	??	??	??	??	M	115/126
274	281202	13	5	type3	??	??	??	169/169	165/201	??	M	115/126
275	281202	13	6	type2	??	114/114	??	169/181	157/213	155/159	F	126
276	281202	13	7	type5	110/110	140/140	144/160	??	181/205	159/159	M	115
277	281202	14	1	type3	136/138	138/138	??	165/165	161/161	??	??	
278	281202	14	2	type1	??	114/114	??	113/113	165/165	147/147	M	115
279	281202	14	3	type3	??	??	??	161/169	165/201	163/163	??	
280	281202	14	4	type5	114/114	126/126	??	133/169	161/233	139/159	F	126
281	281202	14	5	type3	??	114/114	152/152	117/125	197/197	195/195	M	115/126
282	281202	14	6	type2	132/136	140/140	160/160	??	??	??	F	126
283	281202	14	7		??	??	??	??	??	??	??	
284	281202	14	8	type4	102/102	106/106	142/186	165/165	193/193	195/195	F	126
285	281202	16	1	type3	126/128	140/140	158/158	141/141	201/201	163/179	M	115/126
286	281202	16	2	type1	134/136	140/140	158/158	141/141	181/205	159/171	M	115/126
287	281202	21	1		??	??	??	??	??	??	??	
288	281202	21	2	type1	??	??	??	113/113	??	??	??	

Appendix A: DNA Results from Black-tailed Deer Pellets Collected on Olympic Peninsula.

Sample	Plot ID	Transect	Specimen	RFLP	TEXAN4	CRSP-01	RT-5	CAL-M	CAL-O	CAL-D	Gender	Alleles
289	281202	21	3	type7	???	???	???	???	169/169	???	M	115
290	281202	21	4	type3	???	???	???	121/121	173/177	175/179	???	???
291	281202	21	5		???	???	???	???	???	???	???	???
292	281202	24	1	type7	???	???	???	125/165	169/169	???	???	???
293	281202	24	2	type3	???	???	???	???	153/153	151/151	???	???
294	281202	24	3		???	???	???	???	???	???	???	???
295	281202	24	4		???	???	???	???	???	???	???	???
296	281202	24	5	type2	94/94	114/114	???	???	165/165	167/167	M	115
297	281202	24	6	type5	???	???	???	???	153/153	139/139	???	???
298	281202	27	2	type3	???	???	???	121/153	153/169	167/187	???	???
299	281202	27	3		???	???	???	???	???	???	???	???
300	281202	27	5	type1	???	???	???	???	157/157	155/179	???	???
301	281202	27	6		???	???	???	???	???	???	???	???
302	281202	27	7	type4	???	???	???	???	???	???	???	126
303	281202	27	8	type4	???	???	???	125/141	173/213	123/143	M	115
304	281202	27	9	type3	???	???	???	141/157	145/157	131/139	???	???
305	281202	28	1	type2	???	???	???	133/133	165/181	135/143	???	???
306	281202	28	2		???	???	???	???	???	???	???	???
307	281202	28	3	type2	???	???	???	125/125	161/185	147/163	M	115
308	281202	28	4		???	???	???	???	???	???	???	???
309	281202	28	5	type2	???	???	???	121/161	149/161	139/139	???	???
310	281202	28	7		???	???	???	???	???	???	???	???
311	281202	28	9		???	???	???	???	???	???	???	???
312	281202	30	1		???	???	???	???	???	???	???	???
313	281202	32	1		???	???	???	???	???	???	???	???
314	281202	32	2		???	???	???	???	???	???	???	???
315	281202	32	3	type1	???	???	???	???	177/177	127/127	???	???
316	281202	32	4	type3	???	???	???	???	165/189	???	???	???

Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

Vail Deer

99R6-015 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATTACATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATATRC  
CCCAGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTACTTAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGAUTACAGCCCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAUTGCATCTTGAGCA  
TCCTCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTATTTC  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTTC  
CATGGTTCAACCCTATAACTCTTTCCCCCCCC—CGGAAA

99R6-018 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATTACATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCAGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAAATCGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGAUTACAGCCCCATGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTTKGGGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAUTGCATCTTGAGCA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TCCCCATAATGGTAGGCACGAGCATCATAATTAAATGGTAACAGGACATAGCTG  
TAATGGTGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC---CAGAAA

99R6-027 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATACTATGTATAATAGTACATTACATTATAC  
CCCAGTCTTAAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCATGCTTAAAGCAAGTACATACAACCAC  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGCCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGGTGAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAAATCGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGACTAACATGCCATGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATTGTAGCTGGACTTAATGCACTTGGAGCA  
TCCCCATAATGGTAGGCACGAGCATCATAATTAAATGGTAACAGGACATAATTG  
TAATGGTGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC---CAGAAA

99R6-045 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATAATTGTATAATAGTACATTACATTATAC  
CCCAGTCTTAAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCATGCTTAAAGCAAGTACATACAACCAC  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGCCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGGTGAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTACTTAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGACTAACATGCCATGCTCACACATAACTGTGATGTCAT

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

ACATTGGTATTTAATTTGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTGAGCA  
TCCTCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAGTTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTTTTCCCCCCCC—CGGAAA

99R6-049 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTCCTAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCAGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATAATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCGCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTACTTAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGAATCAGCCATGCTCACACATAACTGTATGTCAT  
ACATTGGTATTTAATTTGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTGAGCA  
TCCTCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAGTTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTTT-TCCCCCC—CGGAAA

99R6-053 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTCCTAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATACTATGTATAATAGTACATTACATTATTC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AACAGTACATCATATTATACCCCAGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATAATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCGCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TCTTCAGGGCCATCTCATCTAAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAGTACTAATCAGCCATGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTTGGGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATCATAATTAAATGTAACAGGACATAGTTG  
TAATGGTGAGTATGGACATTGCAGTCATGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC—CGGAAA

99R6-063 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTAAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCTATGCTTAAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGCCCTAGATCACGAGCTTAATTACCA  
TGCCCGGTGAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACATTACAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAGTACTAATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTGGGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATCATAATTAAATGTAACAGGACATAGTTG  
TAATGATGAGTATGGACATTGCAGTCATGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC---CGGAAA

99R6-066 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATACTATGTATAATAGTACATTACATTATAC  
CCCATGCTTAAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCTATGCTTAAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCGCCCTAGATCACGAGCTTAATTACCA  
TGCCCGGTGAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

CCCATATATCGTGGGGTAGCTATTAAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAGTGACTAACATCAGCCATGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTTGGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATACATAATTAAATGGTAACAGGACATAATTG  
TAATGGTGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC---CAGAAA

99R6-069 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATACTATGTATAATAGTACATTACATTATTC  
CCCATGCTATAAGCAAGTACATAAAATTAAATGTATTAAAGACATATTATGTAT  
AACAGTACATCATATTATACCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTC  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCGCGTAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAGTGACTAACATCAGCCATGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTTKGGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATACATAATTAAATGGTAACAGGACATAATTG  
TAATGGTGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC---CGGAAA

99R6-071 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTATAAGCAAGTACATAAAATTAAATGTATTAAAGACATATCATGTAT  
AATAGTACATCATATTATACCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTC  
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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TCCTTCTGCCAACATGCGTATCCGTCCCCAGATCACGAGCTTAATTACCA  
TGCGCGTAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTCAGGGCCATCTCACCTAAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAGTGAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTATTTTGGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCATCTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGTAACAGGACATAGTTG  
TAATGGTAGTATGGACATTGCAGTCATGGTAGCAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCC—CGGAAA

99R6-076 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTAAAAATTCAATAA  
TTAACAGTTTCACTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCATTGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATAATCGTCCATAGCACATTAGTCAAA  
TCCTTCTGCCAACATGCGTATCCGTCCCCAGATCACGAGCTTAATTACCA  
TGCGCGTAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTCAGGGCCATCTCACCTAAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAGTGAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTGGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCATCTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGTAACAGGACATAGTTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAGCAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCC—CGGAAA

99R6-089 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTAAAAATTCAATAA  
TTAACAGTTTCACTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

AATAGTACATCATATTATACCCTATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGAATCAGCCCAGTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTCAGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAGTTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC—CGGAAA

99R6-095 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTAAGTACTAGGACATACTATGTATAATAGTACATTACATTATAC  
CCCATGCTTAAAGCAAGTACATAAAATTAAATGTATTAAAGACATATTATGTAT  
AATAGTACATCATATTATACCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGAATCAGCCCAGTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTTCAGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAGTTG  
TAATGGTGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCC—CAGAAA

99R6-096 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TAAAATTAAATGTACTAGGACATACTATGTATAATAGTACATTACATTATATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCCATAGCACATTAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAGTGAUTACAGCCATGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTTGGGGGATGCTTGGACTCAGCTATGGCCGTCA  
AAGGCCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTG  
TAATGGTGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC---CAGAAA

99R6-099 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTTCTAAAAAAATTCAATAA  
TTAATACAGTTTCACCTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCCATAGCACATTAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTACTTAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAGTGAUTACAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGGATGCTTGGACTCAGCTATGGCCGTCA  
AAGGCCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCTCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT-TCCCCCC—CGGAAA

99R6-107 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTTCTAAAAAAATTCAATAA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TTTAATACAGTTTCACTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTAAGGACATACTATGTATAATAGTACATTACATTATATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCCATGCTTATAAGCAAGTACATACAACCAC  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGACTAACATCAGCCATGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTTCAGGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCCCATAATGGTAGGCAAGAGCATACATAATTAAATGTAACAGGACATAATTG  
TAATGGTGAGTATGGACATTGCAGTCAATGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC—CAGAAA

99R6-112 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTTAATACAGTTTCACTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTAAGGACATACTATGTATAATAGTACATTACATTATTTAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTTAAGACATATTATGTAT  
AACAGTACATCATATTATACCCCCATGCTTATAAGCAAGTACATACAACCAC  
TTACAGTACATAGTACATGTAATTATTAAATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAAATCGCCCCTCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGACTAACATCAGCCATGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTTCAGGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCCCATAATGGTAGGCAAGAGCATACATAATTAAATGTAACAGGACATAATTG  
TAATGGTGAGTATGGACATTGCAGTCAATGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCC—CGGAAA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

99R6-119 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATTACATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACCAAGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTACATACCCCCATGCTTATAAGCAAGTACATACAATCAT  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGCCCTAGATCACGAGCTTAACCTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATACTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTGGGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCACTTGAGCA  
TCCCCATAATGGTAGGCACATTGCACTGGCAATTAAATGGTAACAGGACATAGCTG  
TAATGGTAGTATGGACATTGCACTGGTAGCAGGACATAATTATTATTC  
CATGGTTAACCCCTATAACTCTT---TCCCCCC---CGGAAA

99R6-122 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATTACATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACCAAGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTACATACCCCCATGCTTATAAGCAAGTACATACAATCAT  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGCCCTAGATCACGAGCTTAACCTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATACTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTGGGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCACTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATCGTAATTAAATGGTAACAGGACATAGCTG

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TAATGGTGAGTATGGACATTGCACTGGTAGCAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCCCCC—CGGAAA

99R6-126 1

TCCACAAAATCCAAGAGCCTTGTCACTTAAATTCTTAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATACTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AACAGTACATCATATTATACCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATAATCGTCCATAGCACATTAAAGTC  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAATGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTGGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCACTTGGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAGTTG  
TAATGGTGAGTATGGACATTGCACTGGTAGCAGTCAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCCCC---CGGAAA

99R6-127 1

TCCACAAAATCCAAGAGCCTTGTCACTTAAATTCTTAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATACTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATAATCGTCCATAGCACATTAAAGTC  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAATGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTGGGGGATGCTGGACTCAGCTATGGCGTCA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTACTGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATCATAATTAAATGGTAACAGGACATAGTTG  
TAATGGTGAGCATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCC—CAGAAA

99R6-133 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATACTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCCATAGCACATTAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCGCGTAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAATCGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGACTIONCAGCCATGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAAATTTKGGGGGGATGCTTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTACTGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATCATAATTAAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCC—CAGAAA

99R6-138 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATGCCCTATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCCATAGCACATTAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCGCGTAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAATCGCCACTCTTCCCTAAATAAGACAT

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

CTCGATGGACTAGTGACTAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACAGCATTGAGCA  
TCCCCATAATGGTAGGCACGAGCATACATAATTAAATGGTAACAGGACATAAGTTG  
TAATGATGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCC—SGGAAA

99R6-148 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCTATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGCCATCTCACCTAAAATGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGACTAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACAGCATTGAGCA  
TCCCCATAATGGTAGGCACGAGCATACATAATTAAATGGTAACAGGACATAAGTTG  
TAATGATGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCC—CGGAAA

99R6-159 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCTATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

CCCATATATTGTGGGGTAGCTATTAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAGTGACTAACATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTGAGCA  
TCCCATAATGGTAGGCACGAGCATACATAATTAAATGGTAACAGGACATAATTATT  
TAATGATGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATTATT  
CATGGTTCAACCCTATAACTCTT--TCCCCCC—CGGAAA

99R6-166 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTTCTAAAAAAATTCAATAA  
TTAATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATACTATGTATAATAGTACATTACATTATAC  
CCCATGCTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCCATAGCACATTAAAGTC  
TCCTTCTGCCAACATGCGTATCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCGCGTAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATCGTGGGGTAGCTATTAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAGTGACTAACATCAGCCATGCTCACACATAACTGTGATGTCAT  
GCATTGGTATTTAATTTGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTGAGCA  
TCCCATAATGGTAGGCACAGAGCATACATAATTAAATGGTAACAGGACATAATT  
TAATGGTGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATTATT  
CATGGTTCAACCCTATAACTCTT--TCCCCCC---CAGAAA

99R6-167 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTTCTAAAAAAATTCAATAA  
TTAATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCACATTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCCATAGCACATTAAAGTC  
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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TCCTTCTGCCAACATGCGTATCCGTCCCCAGATCACGAGCTTAATTACCA  
TGCCGCGTAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTACTTAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGAATCAGCCCCTGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTGGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCATCTGAGCA  
TCCTCATAATGGTAGGCACGAGCATATAATTAAATGTAACAGGACATAATTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC—CGGAAA

99R6-168 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTTCTAAAAATTCAATAA  
TTAACAGTTTCACTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATATRC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATATTATACCCATTGCTTATAAGCAAGTACATACAACCATT  
TTACAGTACATAGTACATGCAATTATAATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCGTCCCCAGATCACGAGCTTAATTACCA  
TGCCGCGTAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGAATCAGCCCCTGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCATCTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCC—CGGAAA

99R6-175 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTTCTAAAAATTCAATAA  
TTAACAGTTTCACTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

AATAGTACATCATATTATACCCTATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAATCGCCCCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGAATCAGCCCAGTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTCAGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAGTTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT-TCCCCCC---CGGAAA

99R6-179 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTAATTAGGACATATTATGTATAATAGTACATTACATTATRC  
CCCATGCTTAAAGCAAGTACATAAAATTAAATGTATAAGACATATTATGTAT  
AATAGTACATCATATTATACCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATAATCGTCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTACTTAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAATCGCCCCTTCCCTAAATAAGACAT  
CTCGATGGACTAGTGAATCAGCCCAGTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTCAGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCATCTTGAGCA  
TCCCTATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAGTTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT-TCCCCCC---CGGAAA

Physt Deer

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

99R6-226 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATTACATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAAGACATATTATGTAT  
AATAGTACATCATACTATACCCCCATGCTTATAAGCAAGTACATACAACCACAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTGGGGGGATGCTTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCACTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTTC  
CATGGTTAACCCCTATAACTCTT--TCCCCCC—SGGAAA

99R6-227 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATTACATTACATTCAACACTACCACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAAGACATATTATGTAT  
AATAGTACATCACAATACACCCCCATGCTTATAAGCAAGTACATACAACCACAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAAATCGCCCCTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTGGGGGGATGCTTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCACTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAAGTTG

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTTT-TCCCCCCCCC-GGGAAA

99R6-228 1

TCCACAAAATCCAAGAGCCTTGTCACTTAAATTCTTAAAAATTCAATAA  
TTAACATACAGTTTCACTAACAGCCATTACATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATACTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTGGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACTGCATCTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTTT--TCCCCCCCCC-GGGAAA

99R6-237 1

TCCACAAAATCCAAGAGCCTTGTCACTTAAATTCTTAAAAATTCAATAA  
TTAACATACAGTTTCACTAACAGCCATTACATTACATTCAACACTACCACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCACAATACACAGCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAAATGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTGGGGGATGCTGGACTCAGCTATGGCGTCA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTACTGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATCATAATTAAATGGTAACAGGACATAGTTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCCCGGGAAA

99R6-238 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATATTACATTTCACACTACCACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCACACTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCGCGTAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAATGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAAATTTGGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTACTGCATCTGAGCA  
TCCCCATAATGGTAGGCACGAGCATCATAATTAAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCCGGGAAA

99R6-239 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCACACTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCGCGTAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAATGCCACTCTTCCCTAAATAAGACAT

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

CTCGATGGACTAATGACTAACAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACAGTCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTG  
TAATGATGAGTATGGACATTACAGTCATGGTAACAGGACATAATTATTATTC  
CATGGCTCAACCCTATAACTCTT--TCCCCCC—GGAAA

99R6-241 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTAAAAATTCAATAA  
TTAATACAGTTTCACCTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTATAAGCAAGTACATAGAATTATGTATTAAGACATACTATGTAT  
AATAGTACATCACATTATACCCATGCTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCATAGCACATTAAAGTCAA  
TCCCTCTTGTCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTCTCCCCCTAAATAAGACAT  
CTCGATGGACTAGTACTAACAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACAGTCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAAGTTG  
TAATGGTGAGTATGGACATTGCAGTCATGGTAACAGGACATAATCATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC—CGGAAA

99R6-242 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTAAAAATTCAATAA  
TTAATACAGTTTCACCTAACAGCCATATTACATTTCACACTACCACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTATAAGCAAGTACATAAAATTATGTATTAAGACATATTATGTAT  
AATAGTACATCACACTATACCCATGCTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

CCCATATATTGTGGGGTAGCTATTAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCATCTAAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAACATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTATT  
TAATGATGAGTATGGACATTGCACTGGTAACAGGACATAATTATT  
CATGGTTCAACCCTATAACTCTT?-CCCCCCCCC-GGGAAA

99R6-246 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTTCTAAAAAAATTCAATAA  
TTAATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATACTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCGCGTAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAACATGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATT  
TAATGATGAGTATGGACATTACAGTCAATGGTAACAGGACATAATTATT  
CATGGCTCAACCCTATAACTCTT--CCCCCCCCC-GGGAAA

99R6-248 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTTCTAAAAAAATTCAATAA  
TTAATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATACTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAAGTCAAA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TCCTTCTGCCAACATGCGTATCCGCCCCAGATCACGAGCTTAATTACCA  
TGCCGCGTAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATAATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCT  
TCTCAGGGCATCTCACCTAAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTCAGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGTAACAGGACATAATTG  
TAATGATGAGTATGGACATTACAGTCATGGTAACAGGACATAATTATTATC  
CATGGCTCAACCCTATAACTCTT---TCCCCCCCGGGAAA

99R6-249 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTATAAGCAAGTACATAAAATTAAATGTATCAGGACATATTGTAT  
AATAGTACATCATATTATACCCATGCTTATAAGCAAGTACATACAACCAC  
TTACAGTACATAGTACATGCAATTATAATCGTCCATAGCACATTAGTCAAA  
TCCTTCTGCCAACATGCGTATCCGCCCCAGATCACGAGCTTAATTACCA  
TGCCGCGTAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATACATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCT  
TCTCAGGGCATCTCACCTAGAACGCCCAGCTTCCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTCAGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGTAACAGGACATAATTG  
TAATGGTGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC---CGGAAA

99R6-251 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATRC  
CCCATGCTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

AATAGTACATCATACTATACCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTCAGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC-GGGAAA

99R6-252 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTACGGGTATAGTACA  
TAAAATTAAATGTAATTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTAAAGCAAGTACATAAAATTAAATGTATTAAAGACATATTATGTAT  
AATAGTACATCATACTATACCCCATGCTTATAAGCAAGTACATACAACCAC  
TTACAGTACATAGTACATGCAATTATTGATCGTCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTCAGGGGATGCTGGACTCAGCTATGGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAATGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC-GGGAAA

99R6-253 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTACGGGTATAGTACA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATATAC  
CCCATGCTTATAAGCAAGTACATAGAATTATGTATTAAGACATACTATGTAT  
AATAGTACATCACATTATACCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCCATAGCACATTAAAGTCAAA  
TCCCTTCTTGTCAACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGGTGAAACCAACAAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTCTTCCCCCTAAATAAGACAT  
CTCGATGGACTAGTGAUTACAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGGATGCTTGGACTCAGCTATGCCGTCA  
AAGGCCCCGACCCGGAGCATATATTGTAGCTGGACTTAACTGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATCATTATTC  
TAATGGTGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATCATTATTC  
CATGGTTCAACCCTATAACTCTTT-TCCCCCC—CGGAAA

99R6-254 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATCAGGACATATTATGTAT  
AATAGTACATCATATTATACCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCCATAGCACATTAAAGTCAAA  
TCCCTTCTTGCACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGGTGAAACCAACAAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAGAATGCCACTCTTCCCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTGGGGGGATGCTTGGACTCAGCTATGCCGTCA  
AAGGCCCCGACCCGGAGCATATATTGTAGCTGGACTTAACTGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTATTATTC  
TAATGGTGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTTT--TCCCCCC—CGGAAA

99R6-255 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAAATTCAATAA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TTTAATACAGTTTCACTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTAAGGACATATTATGTATAATAGTACATTACATTATATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTTAAGACATATTATGTAT  
AATAGTACATCATACTATACCCCCATGCTTATAAGCAAGTACATACAACCAC  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACATTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAACATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTAAATTGGGGGATGCTTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATACATAATTAAATGGTAACAGGACATAGTTG  
TAATGATGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCC-CCC-GGGAAA

99R6-257 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTTAATACAGTTTCACTAACAGCCATTACATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTAAGGACATATTATGTATAATAGTACATTACATTATATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTTAAGACATATTATGTAT  
AATAGTACATCATACTATACCCCCATGCTTATAAGCAAGTACATACAACCAC  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCCGTGAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACATTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAACATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTAAATTGGGGGATGCTTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATACATAATTAAATGGTAACAGGACATAGTTG  
TAATGATGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCC-CCC-GGGAAA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

99R6-258 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATTACATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATCAGGACATATTATGTAT  
AATAGTACATCATATTATACCCCCATGCTTATAAGCAAGTACATACAACCAC  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAGAACATCGCCCACCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAACATCAGCCCAGCTCACACATAACTGTATGTCAT  
ACATTGGTATTTAATTTCAGGGGGATGCTTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACATGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAGTTG  
TAATGGTAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTAACCCCTATAACTCTT--TCCCCCC—CGGAAA

99R6-259 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATTACATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAGAACATTAAATGTATTAAAGACATACACCAC  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAAA  
TCCTTCTGTCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAAATTACCA  
TGCCCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAATCGCCCACCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAACATCAGCCCAGCTCACACATAACTGTATGTCAT  
ACATTGGTATTTAATTTCAGGGGGATGCTTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACATGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTG

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TAATGGTGAGTATGGACATTGCAGTCATGGTAACAGGACATAATCATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC—CGGAAA

99R6-260 1

TCCACAAAATCCAAGAGCCTTGTCACTTAAATTCTTAAAAATTCAATAA  
TTAACATACAGTTTCACTAACAGCCATTACATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATACTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAAGTC  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCGCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCCAGCTCACACATAACTGTGATGTC  
ACATTGGTATTTAATTTCAGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAAGTGCATCTGAGCA  
TCCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC—GGGAAA

99R6-261 1

TCCACAAAATCCAAGAGCCTTGTCACTTAAATTCTTAAAAATTCAATAA  
TTAACATACAGTTTCACTAACAGCCATTACATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATACTATACCCCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAAGTC  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCGCGTGAAACCAACAACCCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCCAGCTCACACATAACTGTGATGTC  
ACATTGGTATTTAATTTCAGGGGATGCTGGACTCAGCTATGCCGTCA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTACTGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATCATAATTAAATGGTAACAGGACATAGTTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT---TCCCCCCCGGGAAA

99R6-264 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTTCTAAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAGAATTATGTATTAAAGACACTATGTAT  
AATAGTACATCACATTATACCCATTGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCATAGCACATTAAAGTCAA  
TCCCTTCTTGTCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGGTGAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACATTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTCTT-  
CCCCTTAAATAAGACATCTCGATGGACTAGTGACTAATCAGCCCAGCTCACA  
CATAACTGTGATGTCATACATTGGTATTTAATTTKGGGGGGATGCTTGGGA  
CTCAGCTATGCCGTCAAAGGCCCGACCCGGAGCATATATTGTAGCTGGACT  
TAACTGCATCTTGAGCATCCCCATAATGGTAGGCACGAGCATATAATTAG  
GTAACAGGACATAGTTGTAATGGTAGTATGGACATTGCAGTCATGGTAAC  
AGGACATAATCATTATTCCATGGTTCAACCCTATAACTCTTT-  
TCCCCCC—CGGAAA

99R6-265 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAATTTCTAAAAAATTCAATAA  
TTAACATACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGCATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATCAGGACATATTATGTAT  
AATAGTACATCATATTATACCCATTGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAATCGTCATAGCACATTAAAGTCAA  
TCCTTCTTGTGCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCCGGTGAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACATTATCAGACATCTGGTTCTT

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TCTTCAGGGCCATCTCACCTAGAATGCCACTTTCCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAACAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTGAGCA  
TCCCCATAATGGTAGGCACGAGCATACATAATTAAATGTAACAGGACATAAGTTG  
TAATGGTGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC—CGGAAA

99R6-267 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAGAATTAAATGTATTAAGACATACTATGTAT  
AATAGTACATCACATTATACCCCTATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTAAATCGTCCATAGCACATTAAAGTCAA  
TCCCTCTTGTCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCGCGTGAAACCAACAACCCGCTTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACATTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATGCCACTTTCCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAACAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGGATGCTGGACTCAGCTATGGCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACGCATCTGAGCA  
TCCCCATAATGGTAGGCACGAGCATACATAATTAAATGTAACAGGACATAATTG  
TAATGGTGAGTATGGACATTGCAGTCATGGTAACAGGACATAATCATTATTC  
CATGGTTCAACCCTATAACTCTT-TCCCCCC—CGGAAA

99R6-268 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTTAAAAATTCAATAA  
TTAACAGTTTCACTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTATACGGGTATAGTACA  
TAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCACATTACCCATGCTTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCCATAGCACATTAAAGTCAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TGCCGCGTAAACCAACCAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAACAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACAGGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATACATAATTAAATGGTAACAGGACATAATTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT—TCCCCCC—CCGGAAA

99R6-269 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTAAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
GCACAAACTGCATAATAACACATGCATATATAACTTACGGGTATAGTACA  
AAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCATGCTATAAGCAAGTACATAAAATTAAATGTATTAAGACATATTATGTAT  
AATAGTACATCATACTATACCCCCATGCTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATTGATCGTCATAGCACATTAAAGTCAAA  
TCCTTCTGCCAACATGCGTATCCCGTCCCTAGATCACGAGCTTAATTACCA  
TGCCGCGTAAACCAACCAACCCGGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAAAATCGCCCCTCTTCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAACAGCCCAGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTGGGGGATGCTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACAGGCATCTTGAGCA  
TCCCCATAATGGTAGGCACGAGCATACATAATTAAATGGTAACAGGACATAATTG  
TAATGATGAGTATGGACATTGCAGTCATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT—TCCCCCC—CCGGAAA

99R6-270 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTAAAAAATTCAATAA  
TTAACAGTTTCACTTAACAGCCATATTACATTTCACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATATAACTTACGGGTATAGTACA  
AAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCATGCTATAAGCAAGTACATAAAATTAAATGTATCAGGACATATTATGTAT  
AATAGTACATCATAATTACCCCCATGCTATAAGCAAGTACATACAACCAT

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Appendix B: Control Region basepair sequences of mitochondria DNA from black-tailed deer, Washington

TTACAGTACATAGTACATGCAATTATAATCGCCATAGCACATTAAGTC  
AA  
TCCTTCTGCCAACATGCGTATCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCGCGTAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAGAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGATGCTTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACTGCATCTGAGCA  
TCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTATTATTC  
TAATGGTGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC---CGGAAA

99R6-271 1

TCCACAAAATCCAAGAGCCTGTCAGTATTAAATTCTAAAAAAATCAATAA  
TTAACAGTTTCACTAACAGCCATTACATTACATTCAACACTACTACCT  
ACACAAACTGCATAATAACACATGCATATAACTTATACGGGTATAGTACA  
AAAAATTAAATGTACTAGGACATATTATGTATAATAGTACATTACATTATAC  
CCCATGCTATAAGCAAGTACATAAAATTAAATGTATCAGGACATATTGTAT  
AATAGTACATCATATTATACCCATGCTATAAGCAAGTACATACAACCAT  
TTACAGTACATAGTACATGCAATTATAATCGCCATAGCACATTAAGTC  
AA  
TCCTTCTGCCAACATGCGTATCCGTCCCCTAGATCACGAGCTTAATTACCA  
TGCCGCGTAAACCAACAACCGCTGGCAGGGATCCCTCTCGCTCCGGG  
CCCATATATTGTGGGGTAGCTATTAAATGAACCTTATCAGACATCTGGTTCTT  
TCTTCAGGGCCATCTCACCTAGAATGCCACTCTTCCCCTAAATAAGACAT  
CTCGATGGACTAATGACTAATCAGCCATGCTCACACATAACTGTGATGTCAT  
ACATTGGTATTTAATTTKGGGGGATGCTTGGACTCAGCTATGCCGTCA  
AAGGCCCGACCCGGAGCATATATTGTAGCTGGACTTAACTGCATCTGAGCA  
TCCCATAATGGTAGGCACGAGCATATAATTAAATGGTAACAGGACATAATTATTATTC  
TAATGGTGAGTATGGACATTGCAGTCAATGGTAACAGGACATAATTATTATTC  
CATGGTTCAACCCTATAACTCTT--TCCCCCC---CGGAAA

APPENDIX C: Protocols for PCR amplification of six microsatellites , mitochondria control region RFLPs, and sequencing processes for black-tailed deer, Washington state.

#### Black-Tailed Deer Pellet Extraction and PCR Protocols

##### *a. Deer pellet microsatellite PCR amplification 50 °C Multiplex*

.5 ul 10X Promega Buffer (1X)  
0.9 ul 25mM MgCl<sub>2</sub> (1.5mM)  
2.4 ul dNTPs (0.2mM)  
0.15 ul Taq (0.5 U) (Promega)  
0.24 ul CRSP-1FHEX (0.16 uM)  
0.24 ul CRSP-1R (0.16 uM)  
0.35 ul TEXAN-4FFAM (0.23 uM)  
0.35 ul TEXAN-4R (0.23 uM)  
0.35 ul RT-5FTET (0.23 uM)  
0.35 ul RT-5R (0.23 uM)  
0.25 ul Y41-FTET  
0.25 ul Y121-R  
0.25 ul ZFX/Y-FTET  
0.25 ul ZFX/Y-R  
2.0 ul genomic DNA (~25-50 ng)  
5.2 ul water

15 ul total volume

##### i. Cycling (MJ-100 Thermocycler):

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APPENDIX C: Protocols for PCR amplification of six microsatellites , mitochondria control region RFLPs, and sequencing processes for black-tailed deer, Washington state.

1. 94C:00
  2. 92C:30
  3. 50C:30
  4. 72C:30
- repeat steps 2-4 for 35 cycles
5. 72C 4:00
  6. 4C hold

**b. Deer pellet microsatellite PCR amplification California Tetramers**

1.5 ul 10X Promega Buffer  
1.2 ul 25mM MgCl<sub>2</sub> (2.0mM)  
2.4 ul dNTPs (0.2mM)  
0.15 ul Taq (0.5 U) (Promega)  
0.65 ul M-C273F-FAM (0.43uM)  
0.65 ul M-C273-R (0.43 uM)  
0.45 ul D-C89F-HEX (0.3 uM)  
0.45 ul D-C89-R (0.3 uM)  
0.65 ul O-T159S-FTET (0.43 uM)  
2.0 ul genomic DNA (~25-50 ng)  
4.25 ul water

15 ul total volume

APPENDIX C: Protocols for PCR amplification of six microsatellites , mitochondria control region RFLPs, and sequencing processes for black-tailed deer, Washington state.

a. ***Deer pellet microsatellite PCR amplification California Tetramers (continued)***

i. **Cycling (MJ-100 Thermocycler):**

1. 94C2:00
  2. 92C:30
  3. 55C :30
  4. 72C:30
- repeat steps 2-4 for 35 cycles
5. 72C 4:00
  6. 4C hold

b. ***Deer pellet MtDNA RFLP Protocol***

Primers: Fain and LeMay, unpublished

LTRPROBB13:

5'-CCACTATTAACACCCAAAGC

HSF21:

5'-GTACATGCTTATATGCATGGG

25 ul PCR reaction volume:

2.5 ul 10X PCR reaction buffer

2.0 ul 25mM MgCl<sub>2</sub> (2.0 mM final)

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APPENDIX C: Protocols for PCR amplification of six microsatellites , mitochondria control region RFLPs, and sequencing processes for black-tailed deer, Washington state.

4.0 ul dNTPs (1.25mM stock)  
1.0 ul LTRPROB13 primer (10 uM)  
1.0 ul HSF21 primer (10uM)  
0.4 ul Taq DNA Polymerase  
1-3 ul of genomic DNA  
q.s. H<sub>2</sub>O

*i. MJ-100 Thermocycler Program:*

Step 1 94 C 2:00  
Step 2 92 C :30  
Step 3 53 C :30  
Step 4 72 C :40  
Step 5 Repeat steps 2-4 35 times  
Step 6 72 C 5:00  
Step 7 4 C Hold

*ii. Restriction Enzyme Digestion of PCR products:*

15 ul total reaction volume:

1.5 ul 10X Enzyme Buffer (for Mse I)  
0.5 ul purified BSA (100 mg/ml stock)  
1.0 ul Mse I  
5.0 ul of PCR product from above  
7.0 ul H<sub>2</sub>O  
Digest at 37 C for ~1hr (more is OK)

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APPENDIX C: Protocols for PCR amplification of six microsatellites , mitochondria control region RFLPs, and sequencing processes for black-tailed deer, Washington state.

*iii. Visualization of RFLP Patterns:*

Add 2 ul of GenePhor Loading Dye to 7.5 ul of the above digest.

Load ~7.0 ul on rehydrated GenePhor gel (Amersham-Pharmacia; GeneGel Clean 15/24; catalog #17-6000-13)

Run gel at 600 volts for one hour.

Remove gel and silver stain as per directions.

Air dry gel, and score haplotypes

*iv. GenePhor Loading dye/buffer:*

10 mM Tris

1 mM EDTA

1.25 ml of 1% xylene cyanol (per 25 mls)

10 mg bromophenol blue (per 25 ml)

Adjust pH to 7.5 with acetic acid

Store at 4C

Black-Tailed Deer Reference Animal Tissue Extraction and PCR Protocols

*c. Black-tailed deer tissue 5% Chelex Extraction Suspension*

5 g chelex (BioRad Chelex-100 Resin)

APPENDIX C: Protocols for PCR amplification of six microsatellites , mitochondria control region RFLPs, and sequencing processes for black-tailed deer, Washington state.

0.2% SDS

10 mM tris pH 7.4

0.5 mM EDTA pH 8.0 (0.5 mM final concentration)

sterile de-ionized water to volume

***d. Black-tailed deer tissue microsatellite multiplex #1***

Each locus (\*) is processed separately with the buffer, dNTPs, MgCl<sub>2</sub>, Taq and water, except the gender loci (+), which are processed together. For each individual, all loci are mixed together in a single tube before electrophoresis (i.e., loci are processed separately in the PCR, but multiplexed together in the gel).

10x Promega ® buffer (10mM Tris-HCL (pH 9.0 at 25°C), 50mM KCL, 0.1% TritonX-100) mixed to 1x concentration

dNTPs	200 µM
MgCl <sub>2</sub>	2 mM
*CRSP-1	0.100 µM
*Texan-4	0.075 µM
*RT-5	0.125 µM
+SRY	0.260 µM
+FX/Y	0.100 µM
Promega ® Taq	0.05 units
Sterile de-ionized water	to 10 µL

PCR Protocols

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APPENDIX C: Protocols for PCR amplification of six microsatellites , mitochondria control region RFLPs, and sequencing processes for black-tailed deer, Washington state.

1.	94°C	2:00
2.	94°C	0:30
3.	52°C	0:30
4.	72°C	0:30
5.	repeat 2-4	35x
6.	72°C	30:00
7.	4°C	Hold

*a. Black-tailed deer tissue microsatellite multiplex #2*

Each locus (\*) is processed separately with the buffer, dNTPs, MgCl<sub>2</sub>, Taq and water. For each individual, all loci are mixed together in a single tube before electrophoresis (i.e., loci are processed separately in the PCR, but multiplexed together in the gel).

10x Promega ® buffer (10mM Tris-HCL (pH 9.0 at 25°C), 50mM KCL, 0.1% TritonX-100) mixed to 1x concentration

dNTPs	200 µM
MgCl <sub>2</sub>	2 mM
*C-273 (Locus M)	0.100 µM
*C-89 (Locus D)	0.075 µM
*T-159 (Locus O)	0.125 µM
Promega ® Taq	0.05 units
Sterile de-ionized water	to 10 µL

PCR Protocols

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APPENDIX C: Protocols for PCR amplification of six microsatellites , mitochondria control region RFLPs, and sequencing processes for black-tailed deer, Washington state.

1.	94°C	2:00
2.	94°C	<b>0:30</b>
3.	55°C	0:30
4.	72°C	0:30
5.	repeat 2-4	32x
6.	72°C	30:00
7.	4°C	hold

*a. Black-tailed deer tissue Control Region Sequencing Protocols*

*i. Initial PCR*

10x Promega ® buffer (10mM Tris-HCL (pH 9.0 at 25°C), 50mM KCL, 0.1% TritonX-100) mixed to 1x concentration

DNTPs	200 µM
MgCl <sub>2</sub>	1.5 mM
LOdo1	0.4 µM
HOdo2	0.4 µM
Promega ® Taq	0.15 units

APPENDIX C: Protocols for PCR amplification of six microsatellites , mitochondria control region RFLPs, and sequencing processes for black-tailed deer, Washington state.

Sterile de-ionized water	to 15 µL
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### PCR Protocols

1.	94°C	2:00
2.	94°C	0:30
3.	52°C	0:45
4.	72°C	0:45
5.	repeat 2-4	40x
6.	72°C	5:00
7.	4°C	Hold

#### i. Sequencing Protocol

Perkin-Elmer Big Dye Terminator Cycle Sequencing kits were used for all sequencing reactions. We followed the manufacturer's recommended protocols for chemistry, PCR and for gel preparation. We sequenced in both directions in separate reactions using the LOdo1 and HOdo1 primers.